The Iron Age

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Casting a 500 Ton Anvil Block at Perm, Russia.

The German Edition of *Engineering*, of recent date, contains the following account of the casting of a 500 ton anvil block, which will be read with interest by all who are familiar with foundry operations:

The gun factory at Perm, a town situated on the banks of the River Kama, in the north-eastern part of Russia, belongs to the Russian government, and was erected for the purpose of manufacturing cast steel guns of large calibre. Up to the present time the steel blocks used for these guns have been formed under a 15 ton steam hammer, but the ever increasing requirements proved the insufficiency of this tool, and it was decided to erect a large double acting 50 ton steam hammer, calculated, when using top steam, to be equal in effect to a 100 ton single acting hammer. For this it was necessary to cast an anvil block of solid iron 500 tons in weight. The work was begun in the summer of 1869, when the foundation for the anvil block was laid. First, it was necessary to ascertain the geological formation of the ground on which the hammer and anvil block were to be erected. Borings were accordingly made, which showed the following stratification of the ground: A, red and blue clay, 23 feet thick; B, coarse sand and boulders, 6 feet thick; C, very red and coarse ground sand, 7 feet thick; D, fine and strong sand stone, but cleft in all directions; E, dense and compact gray slate, with gypsum imbedded, which run down to a depth of 63 feet without being traversed, and as it showed a resistance of 680 lbs. per square inch, it was considered a good basis for a foundation. The excavation was performed with a water tight caisson and compressed air, on account of the two strata B and C, which contained a quantity of water. The air was compressed to 16 lbs. per square inch in the caisson. After having reached the slate and entered it to a depth of 7 ft., the surface was leveled and covered with two cross layers of 12 inch larch beams *m* (See Fig. 1), which were strongly painted with tar and covered with a layer of felt. Upon this came three courses of strong sandstone masonry, *n n*, laid in cement. Each of the stones used in this construction had a weight of from 16 to 19 tons. This change of wood and masonry was repeated twice more, and the whole ultimately covered by a double course of larch beams, upon which the anvil block was to be placed.

This foundation, shown by 1 and 2, having been completed by the month of October, 1871, the pile driving for the foundations of the main hammer buildings began and was continued during the whole winter. The central part of these buildings for containing the hammer is a tower-like construction, and consists of an iron roof supported by four wrought iron pillars of ¼ inch boiler plates. The surrounding buildings for the boilers, welding, and reheating furnaces are of a similar construction.

In October, 1872, the central tower was completed, and the preparations for casting the anvil-block were begun. The latter has the form of a prism with a base 16½ ft. square and 5 ft. high, joining a pyramid 9 ft. high, and with a top 9 ft. 8 in. square. The cubical contents of the whole block is, therefore, 2700 cubic feet. To compress the iron on the top of the anvil-block, it was decided to cast the block upside down; it was necessary, therefore, to furnish it with two trunnions *g g*, upon which it could be turned to its proper position after having cooled. These trunnions *g*, at the same time, served as inlets for the molten iron during the casting.

The block was cast on the top of its definitive foundation, and after the casting pit had been well dried and warmed, the molding itself began. First of all a strong iron frame-work *i i* was erected in the pit around the sides of the block, this consisting of vertical cast iron beams covered with 2 in. cast iron plates, the whole firmly held together by strong tie-rods. The hollow space in this structure was filled with molding sand. This completed, four layers of common bricks, *o*, were placed on the bottom of the mold, namely, on the top of the foundation, all these being laid in loam and well dried. In the second layer of these bricks several flues were provided for the escape of steam and gases. Upon the common bricks four courses of firebricks *p p* were placed in such a manner that in the first course the bricks were laid flat, and in the three others they formed an inverted arch. A mixture of fire clay and quartz served as mortar and filling material. Upon this followed three layers of fire bricks set on end, after which the sides of the mold were built up with large fire bricks (two and a half times as long as the common bricks), and the space between this brick wall and the iron framing was firmly rammed with molder's sand. Cast iron pipes were fixed in this sand for the escape of the gases. In the same manner were molded the pinions and the channels for the liquid iron.

Simultaneously with the preparation of the mold, the following works were carried out:

a. The Erection of the Cupolas for Melting the Pig Iron.—14 Mackenzie cupolas A' A' A' were erected around the mold. These cupolas had given such highly satisfactory results on a previous occasion at Perm, that they were considered the best adapted for the present work. The cupolas were constructed upon a brick foundation, with an elliptical cast iron bedplate 2½ in. thick. Each plate had a projecting rim which kept the cupola proper in place. The latter was made of boiler plates lined with fire bricks 4½ in. thick. The space between this brick lining and boiler plate shell was rammed with quartz sand, which also served for the bottom lining of the cupola.

b. The Provisions made for Supplying the Necessary Blast to the Cupolas.—According to the experiments made at Perm in working Mackenzie cupolas with anthracite, it was found that for the proper melting process not less than 4000 cubic feet of air per minute ought to be supplied to each of the cupolas. To provide for so large a quantity of blast for the 14 cupolas, three blowing engines were adapted to this purpose, namely:

1. A horizontal engine, with four blowing cylinders, worked by a 120 horse-power two-cylinder engine. The diamater of blowing cylinders was 6½ ft., and stroke 7 ft., the engine making from 22 to 24 revolutions per minute.

2. A vertical blowing engine of 60 horse-power, having two blowing cylinders of 6 ft. diameter, and 7 ft. stroke, making 21 revolutions per minute.

3. A newly constructed blowing engine with two cylinders, the pistons of these cylinders, as well as of the steam cylinders, being fixed to common piston rods. The blowing cylinders of this engine have a diameter of 8 ft., a stroke of 7½ ft., and make from 14 to 17 double strokes per minute. The blast from the last named engine entered a cylindrical regulator of boiler plates 7 ft. in diameter and 28 ft. long, and left it through a 23 in. pipe, B', C'. The blast of the two first named blowing engines was carried through pipes of the same diameter. These three pipes united to one which carried the blast to the different cupolas at a distance of 640 yards. 141,120 lbs. of anthracite, 114,240 lbs. of coke—in all, 255,360 lbs. of fuel—and 1,786,400 lbs. of pig iron, obtained mainly from the well known Blagodat ores, were weighed and prepared for the working of the cupolas. On the 26th of January, 1873, at 3·15 a. m., the cupolas were lighted; at 3·45 a. m. the blast was turned on with one engine working; 10 minutes later the second, and after the lapse of another 10 minutes, the third blowing engine was set to work, when the blast pressure was increased to its full force; at 4·05 a. m. the iron began to melt, and the tap holes, which before that time had been kept open, were plugged with clay. Three minutes later the first tapping of iron took place, and the metal entered the mold. In this working order the cupolas were kept during two hours; at 6 a. m. they were cleaned for the first time, which operation was completed at 7·40 a. m., after which some repairs became necessary, which, however, were successfully completed in time to begin with the melting at 10·20 a. m.; at 3 p. m. the cupolas were stopped the second time for the sake of cleaning, when the iron in the mold had reached a hight of 10 feet from the bottom, which corresponded to a quantity of 880,000 lbs. of iron; at 7·25 p. m. the cupolas again were filled with materials, and at 10·35 p. m. the blast was turned on; at 11·15 p. m. the iron was tapped, and continued running into the mold till 4·03 a. m., when another cleansing and repairing of the cupolas became necessary. It was found at that time that only 24,000 lbs. of iron were wanting to fill up the whole mold, and it was decided, therefore, to work only ten cupolas for this last portion of the melting. These cupolas were set to work the 27th of January, at 5·26 a. m.; the first tap took place at 7 a. m., and at 7·21 a. m. the whole operation was over.

The following shows the results of the melting operation:

Fig. 1.

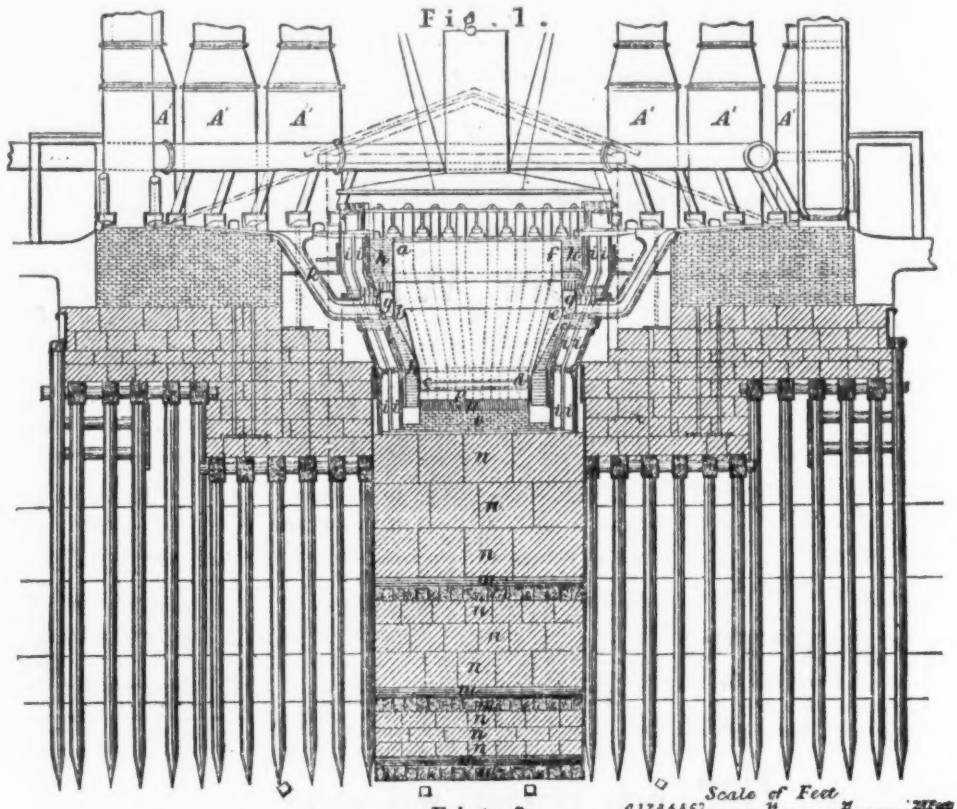
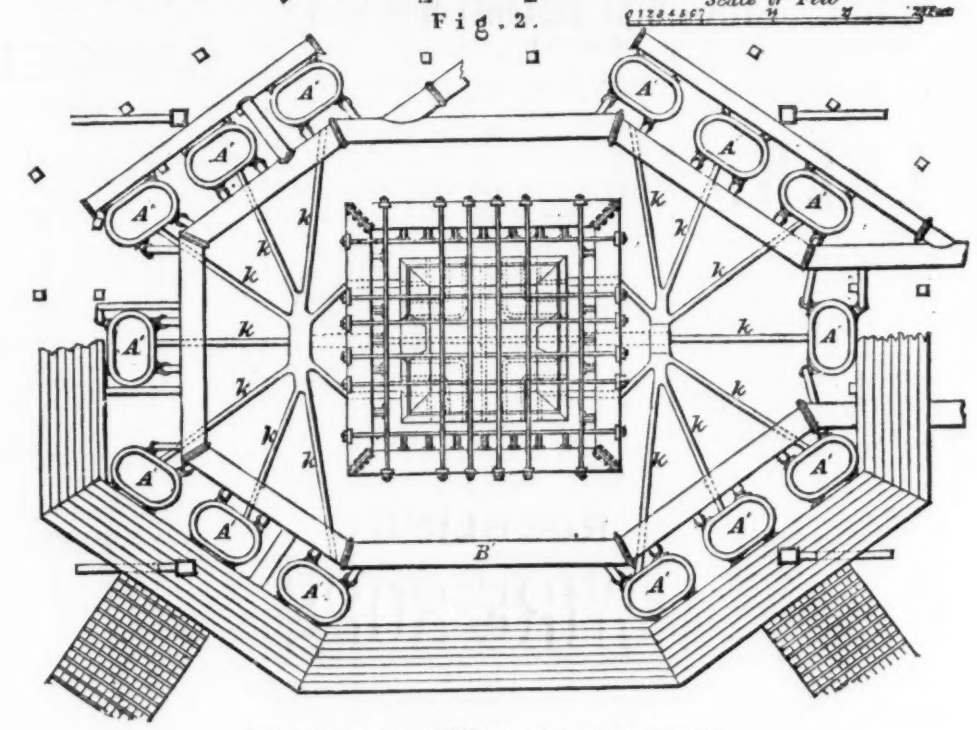


Fig. 2.



FOUNDATION FOR THE 500-TON ANVIL BLOCK AT PERM.

First Melting

Filling 1st consisted of	1530 lb. anth.	and	7600 lb. iron.
" 2d, 3d, and 4th,	800 "	"	7200 "
" 5th and 6th....	480 "	"	3600 "

After this all the 14 cupolas together were worked in the following manner:

54,880 lbs. anthracite 13,440 " coke		509,600 lbs. iron.

Second Melting.

To the fourth filling coke was added, and the whole materials used were:

43,720 lbs. anthracite 26,880 " coke		516,800 lbs. iron.

Third Melting.

Total	20,980 lbs. anthracite 47,040 " coke	459,200 lbs. iron.

Fourth Melting.

Total	15,200 lbs. anthracite 19,200 " coke	920,000 lbs. iron.
Tot. result	136,480 lbs. anthracite 106,570 " coke	1,734,000 lbs. iron.

95,720 lbs. of iron were taken out of the cupolas after the completion of the works.

After the mold had been completely filled the iron surface was covered with coal dust, and was allowed to cool. On the 29th of January a thin crust formed on the iron surface, which could easily be pierced. It was anticipated that it would be necessary to fill up the mold the next day, but after having pierced the hardened crust on the top of the liquid iron, the latter was found to be under a state of compression by the contraction of the cooling surface, so that instead of forming the well known phenomenon of hollows the iron came up blubbering through the pierced hole. On the 31st of January the above mentioned crust had become so hard, that it could not be broken by a blow of 720 lb. weight. The whole mass was then allowed to remain undisturbed for three days. On the 3d of February the molding sand around the iron molding framing was removed, the temperature of the cast iron beams of the latter was 158° Fahr.; on the surface of the 28 in. sand covering on the top of the iron block it was 194° Fahr., with a temperature of 14° Fahr. in the outer atmosphere. On the 24th of February an endeavor was made to measure the temperature of the casting proper, and for this purpose several holes were drilled into the sides of the anvil block, and in these different metals were inserted to ascertain the temperature of the iron. It was found that antimony would melt, and even ignite, whereas brass did not melt. On the 26th of March, zinc would remain unaltered, while lead melted rapidly. According to these trials it was found that the temperature of the casting diminished at the rate of 72° Fahr. per day at the outset, then at the rate of 54°, and toward the end of the cooling at the rate of 32° Fahr. per day.

This casting, probably the greatest ever made, reflects every credit upon the skill, energy and circumspection of the engineer, Mr. Woronzow, aided by a well trained and clever staff.

The economical results were equally satisfactory, as the whole work was completed at an outlay of 63,000 rubles (about $50,000).

The difficult operation of turning the anvil block into the proper position was also successfully carried out in the month of October last. The block was turned round on its journals by two steam engines, and this was done within two hours and a half.

The Proposed Tax on Anthracite.

The Pottsville *Miners' Journal*, discussing the project to levy a tax on anthracite, now under consideration in the Pennsylvania Legislature, says:

We sincerely hope that those who think they possess the power to tax the necessaries of life to raise revenue in a time of peace, and leave the luxuries almost untouched, will seriously reflect on such a policy before they act, and abandon at once such a project. In a war to save the Union the people will stand any tax that may be required, but in a time of peace they will never stand a tax on fuel which is just as necessary as bread, even to the pauper in an almshouse.

If the legislature, however, would provide for the collection of a tax of one cent, or even a half a cent a ton on anthracite coal, to erect three hospitals and endow them in the anthracite coal regions, for the proper treatment of disabled and maimed miners, &c., we feel confident there will be no objections to such a tax from any quarter. The statistics of casualties at the mines are fearful, and common humanity demands their erection. We have just completed the summing up of the number who have been killed and wounded in the anthracite regions in three years, and it foots up:

Killed	972
Maimed	2,358
Total	3,330

A large number of the maimed have since died, and the regions are filled with the maimed who cannot work, and who, in a great many instances, are compelled, themselves or their families, to keep rum shops at the collieries for a support, and thus help to demoralize their neighbors and the community, which would not be the case if provision could be made for their proper care. They will not, except as a last resort, go to the almshouse, and it would be almost a shame to send them there.

Iron in Missouri.—The State of Missouri has made rapid and wondrous progress in iron manufacture, and bids fair to become the Pennsylvania of the West. In three years the amount of capital employed in iron and rail making was trebled, the number of hands more than doubled, and the product increased more than four-fold. In 1873 Missouri produced 120,000 tons of rails, and the immense railway interest west of the Mississippi, in Iowa, Nebraska, Missouri, Kansas, Colorado, and Arkansas, opens a great and increasing market for all the rails that the rolling-mills of Missouri can make. One result of this progress is seen in the tone of the public journals of the State, which is no longer in favor of free trade, but devoted to the increase of mining and manufacturers. This changed tone is also visible in the politics of the State, although no bold stand has yet been taken there for protection. But the iron resources of Missouri are so great that her future can in nowise be doubtful. St. Louis has become the greatest manufacturing center of the West, and all the cities and towns of the State are turning their attention in the same direction, to provide home markets for the teeming grain and provision crops of the West. The iron manufacture of the State seems, however, as yet, to lack capital, the whole amount invested in 1873 being but $5,783,000, though that was an extraordinary increase over 1870, when the total was only $1,914,000. At the same rate the capital ought to reach somewhere about $20,000,000 by the date of the Centenial. Much of the profit of the business in Missouri is reinvested, and iron mining and manufactures seem to be the favored interests.—*North American.*

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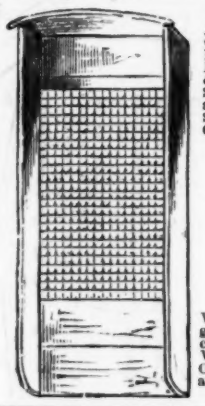

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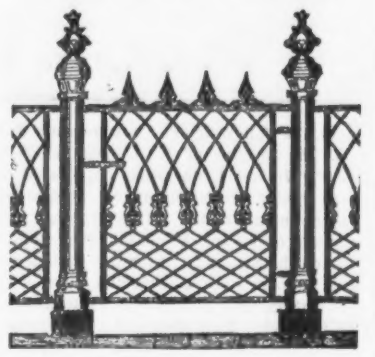

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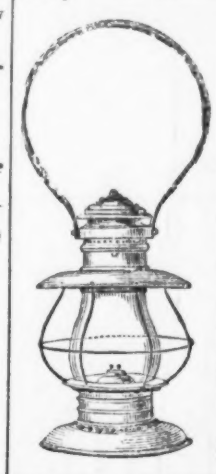

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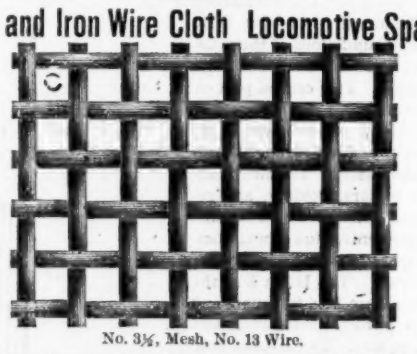

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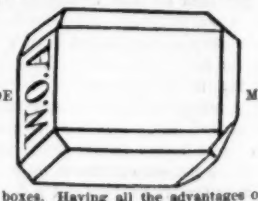

upon the boxes. Having all the advantages of dryness claimed for any other product from the Pacific coast, the form of the crystals, denoting purity, is the same as the best English.

It received the first premium from the American Institute, 1873. Consumers can rely upon the strength and purity of this brand.

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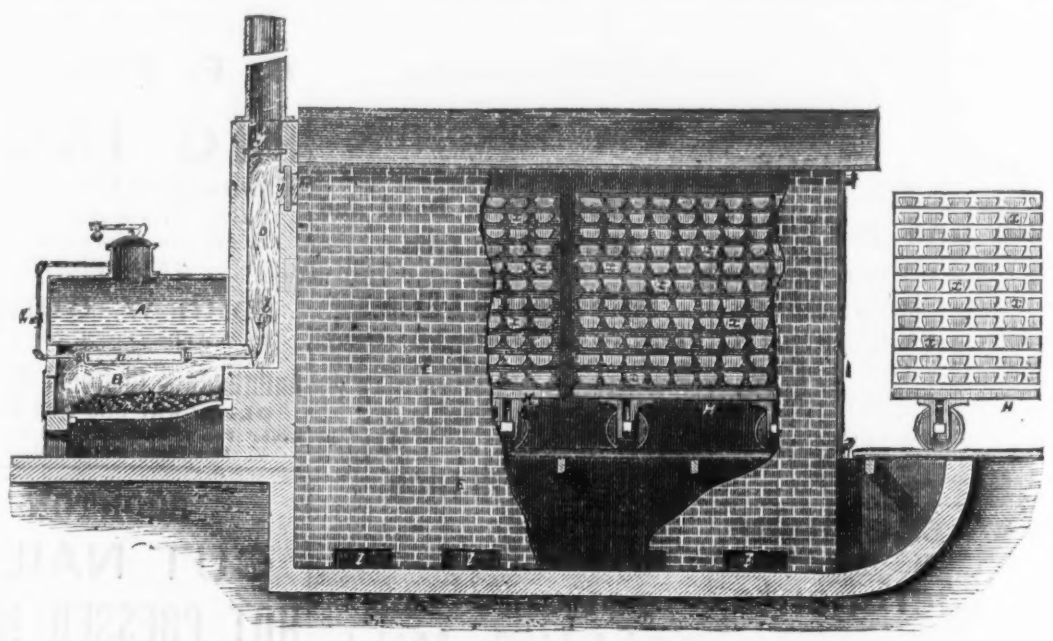
Kidd's Peat Carbonizer.

The accompany illustration represents Kidd's apparatus for charring peat, now in successful operation in the Dunrobin estate of the Duke of Sutherland.

The figure represents a side view of a single drying or carbonizing chamber, containing trucks loaded with the material, etc., to be dried and carbonized. The chamber can be used for drying or carbonizing peat, and is adapted for distilling or extracting gas, oil, etc., for carbonaceous substances, as well as for the manufacture of animal or vegetable charcoal, since it can be raised to any required temperature without the admission of free oxygen. B shows the furnace, A the boiler, *a*, the superheater, *b* the steam jets for forcing the products of combustion through the uptake D into the drying room at *m*, which chamber has no other opening for the escape of the products of combustion than those marked *l, l, l,* at its base; *y* a damper for preventing the escape of the gases up the uptake chimney; *y*, a damper for opening and closing the inlet to the drying chamber; I, iron doors covered with a non-conducting material, X X peat blocks.

When the chamber has been filled with peat, the latter can be thoroughly dried and charred in forty-eight hours by the action of the furnace gases and superheated steam. It is estimated that by this process a ton of peat charcoal can be produced at a cost of 13/6, which sum includes all charges for interest on capital, royalties, labor, raw peat at 3/ per ton, and that used for fuel at 4/6 per ton.



KIDD'S PEAT ECONOMIZER.

For many purposes peat charcoal is said to be better and cheaper than coal. A recent trial of the new fuel upon one of Penn's steam yachts, conducted by Mr. Rumble, of Messrs. Fothergill & Rumble, of George street, Mansion House, London, was highly satisfactory. The party on board included the Duke of Sutherland, and a large number of engineers and others interested in the supply of cheap fuel, and it was found that a speed of 14½ knots per hour could be obtained by the consumption of less than 5 cwts. of the peat fuel. A full head of steam was kept on the whole time, and the pressure constantly, though slightly, increased. There was an entire absence of smoke, very little ash, and no clinker. The fuel is remarkably compact, so that a ton stows readily in less than 50 cubic feet: and as the quantity of water evaporated with peat is greater than with coal, the weight of fuel to be carried for the performance of a given amount of work would, it is considered, be about equal. For factories, land engines and domestic purposes the fuel has much to recommend it, being very cleanly, and capable of stowage in almost any part of the house.

But the purpose to which the invention would probably be most extensively applied is for the manufacture of peat charcoal for iron making purposes. Even on a small scale the peat fuel can, it is said, be made at 8/ per ton, and on a large scale the cost price of the peat would not exceed 6/6. To this must be added the cost of cutting and handling the peat, and preparing it for carbonization. In consequence of the perfect manner in which the peat is prepared, the charcoal manufactured from it is very dense and heavy, has a fine lustrous fracture, and will stand the blast without scintillating almost as well as sound metallurgical coke. So far as it has yet been tested in England, the invention promises to be a great success; as a steam generating fuel, the prepared peat has given every satisfaction, and from the appearance of the peat charcoal designed for iron manufacture, every confidence is felt that it will permit of the manufacture of charcoal iron in Great Britain becoming a general commercial industry.

Iron Ships.

The *Canadian Maritime Review* says:

It would no doubt be an agreeable thing for us to know that wooden ships were the favorite carriers of the world, and that our New Brunswick ships especially were in great demand, but it is just as well to know the truth, even though it may not precisely please us, and not be acting the part of a bankrupt merchant who knows his affairs to be so bad that he is afraid to look into them, and, instead of trying to mend matters, runs heedlessly to ruin. No one can doubt that for some purposes wooden ships are superior to iron vessels; no one can doubt that for some purposes iron vessels are superior to wooden ones. We have ceased to care for the state of the English market as regards the value of our new ships, we build none now for sale or speculation, but we maintain a vast fleet of our own, and year by year we build a considerable fleet to supply the place of those lost or sold. We are, therefore, prepared to hear with complacency that iron ships are not "played out," and that there was a larger amount of tonnage built on the Clyde last year than during any former year in its history. In 1872, the shipping built on the Clyde amounted to 227 vessels, of all sizes, and of an aggregate of 224,000 tons, as against 231 vessels, and 189,800 tons in 1870; last year it amounted to 261,500 tons, the number of vessels being 33 fewer, or 194, as against 227 in the preceding year.

The average size of the vessels, however, shows a great increase. Comparing the average size in 1870 with that of the vessels built last year, we find that in the short period of four years it has risen from 811 tons to 1348 tons—a most extraordinary increase.

There were no war vessels launched last year, which was also the case in the preceding year; nor were there any composite vessels built, such vessels, after being the rage for a few years, have failed to maintain the economical results that were expected of them. In the year 1870 there were six such vessels built, but there was only one in each of the two following years. It is very fortunate that the experiment of building composite vessels here was never entered into. A few wooden sailing vessels were built on the Clyde last year, which should be an encouraging fact for Canadian shipbuilders, and a few paddle steamers, a class of vessels fast falling into disrepute, were also built.

A fact arises in connection with the paddle steamers launched last year that is worthy of special notice. While they had so far fallen into disrepute in 1872 that vessels representing a total of only 6200 tons were launched, there were fourteen such vessels launched last year, of a total of 19,100 tons. But those larger totals are due to the fact that no fewer than five large paddle steamers, of a total of 12,410 tons and 1450 horse-power, were built for the China Steam Navigation Company, by whom they are to be used on the Chinese rivers. They were built by Messrs. A. & J. Inglis, on the American system of construction. There were also two pretty large paddle steamers built by Messrs. John Elder & Co., for the Pacific Steam Navigation Company's local Western American service, a melancholy fact for United States shipbuilders to swallow.

In iron screw steamers there was an increase of 19,200 tons, the totals being 125 vessels of 218,000 tons in the year just closed, as against 146 of 198,800 tons in 1872, 125 vessels of 158,000 tons in 1871, and 112 vessels of 131,870 tons in 1870. This enormous increase is due to the extraordinary growth of the traffic which has now been established by a number of great ocean steam navigation companies—a number which is being added to almost every year. They are not only increasing in number, but those that are already established are constantly engaged in laudible efforts to create feeders to their own main lines, and thereby extending the benefits of commercial relationship with new people, or such as were previously but little known. Even the main lines themselves are yearly receiving one or more additions.

Following up this point a little, we find that not less than 28,895 tons of shipping were added to the fleet of the Pacific Steam Navigation Company last year—nine vessels of 4500 horse-power, six of which were built and engined by Messrs. John Elder & Co., a firm whose reputation has in a great measure been made by the noble specimens of naval architecture which the Fairfield shipyard has added to the fleet, and by the splendid economical results which have been effected by the compound engines supplied to those ships. Never, in any former year, did a shipping company add to its fleet in such an extraordinary degree. Its aggregate tonnage now amounts to 105,000 tons, and the fleet itself numbers 54 steamers, 44 of which have been built on the Clyde during the last ten years. Six steamers, of 18,200 tons and 3500 horse-power, were added to the North German Lloyd's fleet last year, Messrs. Caird & Co. being the builders of four of them, thus making 28 built by them for the same company, almost all of great size. The Peninsular and Oriental Company had four vessels from Messrs. Denny Brothers, and one from Messrs. Barclay, Curie & Co., the total tonnage being 13,325 tons, and 2110 horse-power. Messrs. Henderson Brothers, Glasgow, added to their Anchor Line last year three vessels, two of them being 4250 tons each, the total of the three being 11,250 tons and 1500 horse-power. Other great companies have had supplied to them vessels whose total tonnage varies from 10,500 tons downward. We need not take time to detail them, but we may mention that the Inman Line has had one vessel of 4700 tons added, and one of 4800 tons, and both of 800 horse-power; and we may also mention that the engines supplied to the steamships built on the Clyde during the past year were of the aggregate of 38,500 horse-power, nominal.

Several firms launched between 20,000 tons and 30,000 tons each, and some of them have still got their yards and engine shops largely stocked with work for the present year. Such facts as these are the best answer to the question as to whether iron shipbuilding is in a state of decay; they prove unmistakably its constant and increasing prosperity. They prove, too, and it is just as well to take the lesson to heart, that the business of the world is every year being done more and more by ocean steamers. Such things need not, however, give our shipbuilders any discouragement. There will always be a demand for such fine buoyant and seaworthy vessels as we in the Maritime provinces can build, and the increasing prosperity of our own shipping interests, while iron shipbuilding is also prosperous, proves that the progress of the one is not incompatible with the prosperity of the other.

Determining Titanic Acid in Iron Ores.—Mr. Wm. Bettel suggests the following method of determining titanic acid in titaniferous iron ores: Fuse about 0·5 grm. of the *finely* powdered ore with 6 grms. of pure bisulphate of potash (which has been recently fused and powdered) in a platinum crucible at a gentle heat, carefully increased to redness, and continued till the mass is in a tranquil fusion. Remove from the source of heat, *allow to cool*, digest for some hours in 5 or 6 ozs. of cold distilled water—not *more* than 10 ozs. is to used, as it generally causes a precipitation of some TiO_2—filter off from a little pure white silica, dilute to 45 or 50 ozs., *add sulphurous acid until all the iron is reduced*, then boil for six hours, replacing the water as it evaporates. The titanic acid is precipitated as a *white* powder, which is now to be filtered off, washed by decantation, a little sulphuric acid being added to the wash water to prevent it carrying away TiO_2 in suspension. Dry, ignite, allow to cool, moisten with solution of ammonic carbonate, reignite, and weigh. The titanic acid is invariably obtained as a white powder with a faint yellow tinge, if the process has been properly carried out. I find the method of fusing with bisulphate of potash ("Select Methods," p. 125) to be preferable to all others for decomposing difficult soluble iron ores.

A burner is in use in Canada by which residuum or crude petroleum is used instead of coal or wood in brick kilns. By a simple contrivance the nozzle of the burner is made to throw the flame directly downward at the first firing, and after burning the head (as it is termed), this nozzle is replaced by a straight one, the change being effected in a few moments. The flame is thereby thrown into the arch any required distance, burning the whole kiln from one end, and doing it in much less time than by the old method, and with perfect success as regards the quality of the burning. One man, by this process, will be able to do as much firing as a dozen with the old, as he can attend in as many arches as may be set going in one yard, and by this means save a large item in labor. The tar or petroleum consumed will not cost as much as wood at $3·50 per cord.

By a series of experiments, Mr. Robert Hunt has succeeded in proving that heat does not continue increasing in proportion to depth. Down to 100 fathoms it certainly does so, to the extent of 1 deg. for every 50 ft. But in the second 100 this falls to 1 deg. in 70 ft.; and in the third to 1 deg. in 85 ft. It follows that since great depths do not necessarily involve excessively high temperature, coal working can be carried on below the level previously considered possible. This is practically proved at Charleroi, in Belgium, where coals are won without any difficulty at the depth of 4000 ft., or about three-quarters of a mile. By including the quantity remaining in our coalfields down to that level, the supply would probably be sufficient to last for another 1000 years, even at the present rate of consumption. But it is quite possible that before long considerable saving will result from more economical methods of burning fuel. The quantity of coals required to produce a ton of pig iron fell to 51 cwt. in 1872 from 60 cwt. in 1871—which implied a saving of 9 cwt. per ton on a total production of nearly seven million tons.

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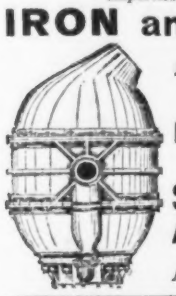
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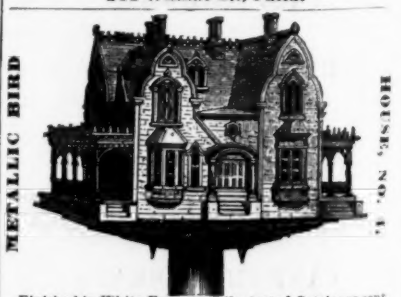

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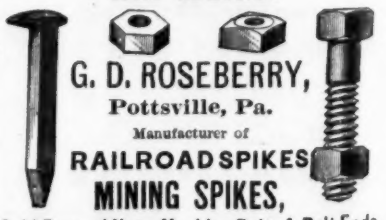
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New Patents.

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

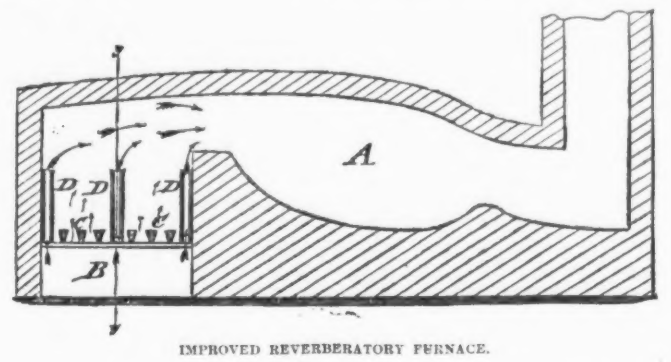
IMPROVEMENT IN REVERBERATORY FURNACES FOR ROASTING ORES.

Specification forming part of Letters Patent No. 147,056, dated February 3, 1874, issued to Ernst Hellgendorfer, of Belmont, Nevada.

The accompanying drawing represents a vertical longitudinal section through a common reverberatory furnace.

Similar letters of reference indicate corresponding parts.

The object of the invention is to so improve the grates of reverberatory and other furnaces that a clear fire, free from smoke, and of the highest oxidizing power, is obtained by currents of heated air, which are introduced between and sidewise to the gases of combustion, so that the caking of the roasted ore is prevented, and the grate applied effectively to roast silver ore, galena and zinc blende. It consists in the introduction of partitions of cast iron plates between and at both sides of the grate, parallel to the grate bars and the fire place, extending as high as the fuel is accumulated on them.



IMPROVED REVERBERATORY FURNACE.

In the drawing, A represents a common reverberatory, Gerstenhofer, or Stadtefeld furnace; B, the fire place, and C the grate bars. Vertical partitions, made of cast iron plates D, are arranged parallel to the axis of the fire place—by preference, one central, the other at the sides of the same, extending through its full length between the grate bars C. These plates D are made high enough to extend slightly above the fuel placed on the grate. The distance of the plates is regulated by the currents of air which are desired to be introduced into the gases of combustion, and form inlets for fresh hot air throughout the whole length of the grate. If, for instance, three partitions are arranged as indicated in drawing, five different currents of gases are produced—two from the fire and three of fresh hot air—which mingle between the fire bridge and arch of the furnace, and throw a clear fire of superior oxidizing quality on the ore.

The number of partitions may be increased, if pine, with pitch or bituminous coal, is burned, in proportion to the smoke producing qualities of the fuel, and also to the width of the grate, the main object being always to introduce a sufficient amount of oxygen between the gases of combustion, and to mix them thoroughly on their passage over the fire bridge. It is, however, desirable sometimes to change the qualities of the fire, so as to have an oxidizing or a reducing fire, for which purpose hot air inlets are arranged in such a manner that some or all of them may be partially or entirely closed.

To increase still more the oxidizing power of such a gas fire, one or more middle currents and an upper current are introduced, so that the fire is embraced by a lower and upper current, and penetrated by a middle one.

Claim.—As an improvement in grates for reverberatory and other furnaces, the fresh air inlets formed by plates D, which are arranged between and sidewise through the full length of the fire place in the direction of the grate bars.

Emery, and its Uses in Iron Metallurgy.

BY DR. J. P. KIMBALL, F. G. S.

In January, 1869, my attention was called by Dr. C. F. Chandler to samples of a non-silicated, highly aluminous magnetite from Westchester county, New York, analyzed by himself and Mr. F. A. Cairns. On visiting the immediate locality, known as Sheep Hill, 2½ miles east of Cruger's, on the Hudson, I found indications of a large deposit of this material, occurring under the usual conditions of the magnetic ore beds of the New York Highlands.

Analyses, as follows, were made of typical specimens of this material as distinguished by the eye into three grades:

	I.	II.	III.	IV.
Magnetic oxide of iron	45·86			
Bisulphide of iron	2·63			
Oxide of manganese	0·55			
Alumina	39·36	41·28	45·29	20·95
Lime	0·47			
Magnesia	7·18			
Phosphoric acid	0.22			
Silicic acid	0·51	0·32	6·82	13·97
Titanic acid	2·41	3·90	1·90	4·15
Water	1·18			
Metallic iron	34·44	35·82	29·16	40·32
Sulphur	1·40			
Phosphorus	0·09			

I., II. Granular, massive, resinous; III. Banded variety, gray in general color, and sparkling—from the presence of a micaceous mineral; IV. Quartzose variety, gray and sparkling, like No. III., but without a banded or gneissic structure.

The above analyses, together with the physical and mineralogical features of this material, serve to identify its character as a mixture of corundum with magnetite, slightly titaniferous, as usual, when thus associated, analogous to the emery of Chester, Mass., and in its proportions bearing a still closer resemblance to specimens obtained by Dr. Genth from the Goldsboro' ore belt of North Carolina in 1871, and analized by this chemist. Like the emery deposits of both of these localities, it is probable that a further development of the Westchester belt will prove it to be in association with magnetic iron ore.

In view of the occurrence of this material in such quantities as to be cheaply won, and in consideration of the fact that it falls short of the standard of a first-class emery as applied to the arts, the interesting question arises as to whether some use may not be found for it in iron metallurgy, especially as a refractory iron ore for lining the puddling furnace, open hearths, and Bessemer converters, as well as an aluminous flux in the blast furnace in admixture with a silicious stock.

Puddling furnace.—As a refractory material rich in magnetic oxide of iron, and free from deleterious minerals, this ore would seem to commend itself for the lining or fettling of the puddling furnace. From its probable infusibility at puddling furnace heat, and the slow action upon it of acid slag, there is strong reason to anticipate that it will "stand" better than ordinary magnetites, titaniferous magnetites, or even ilmenite. Such must have been the use made of what ore was shipped from this locality many years ago, some of which appears to have been tested for this purpose by the Bethlehem Iron Company, as I infer from the description of an ore said by Mr. Fritz to have possessed these qualities to an extraordinary degree.

Open hearths, regenerative or gas furnaces (Siemens and Siemens-Martin process.)—One of the most important conditions in producing iron and steel by the open hearths or direct processes, is a lining capable of resisting the high degree of heat requisite for the precipitation of iron, and at the same time capable of resisting the chemical action, without, at least, imparting undesirable properties either to the metal or slags. Mr. Siemens has recently described his experiments in search of such a lining, and the difficulties he met with. (*Journal of the Iron and Steel Inst.*, 1873, i. 41). Quartz bricks used in the construction of the furnace melt rapidly away under the action of the lime used in their composition, beside what, in the Siemens process, it is requisite to add to the ore for the formation of fusible slag. Silicious material is, furthermore, objectionable in the construction of these furnaces, as it prevents the formation of basic slags. Hence Mr. Siemens, following out a suggestion of M. le Chatelier, undertook to construct the roof and sides of the furnace of bricks composed of beauxite, from Beaux, in France, an aluminous iron ore (also used as an ore of aluminum) consisting essentially of hydrous alumina, together with variable proportions of hydrous and anhydrous sesquioxide of iron. These bricks, although found to be equal in heat resisting power to silex bricks, failed to answer the purpose, "owing to the great contraction of the mass when intensely heated, and non-cohesion with the same material introduced for the purpose of repair." Subsequent experiments by Mr. Siemens to solidify beauxite powder, previously calcined, resulted in the successful use of 3 per cent. of argillaceous clay as a binding material, together with about 6 per cent. of plumbago powder, which serves to reduce to the metallic state the sesquioxide of iron contained in the beauxite, thus rendering the mass practically infusible. Water glass, or silicate of soda, answered the purpose of a binding agent, with the advantage of setting into a hard mass at a comparatively low temperature, although this mixture proved inferior in practice. A lining of beauxite brick of the former composition, and bound together with fluid cinder, which protects the inner surfaces from contact with the flame, resists the heat and fluid cinders to a remarkable degree, as demonstrated at Birmingham by Mr. Siemens, who has observed that when beauxite is exposed to such intense heat it is converted into emery. The calcined beauxite used for the above experiments was of the following composition:

Alumina	53·62
Sesquioxide of iron	42·26
Silica	4·12

In the raw state this mineral, according to Mr. Siemens, contains some 12 per cent. of water. (*Journal Iron and Steel Inst.*, 1873, i. p. 51). Other analyses give a much larger percentage.

The above analysis shows the beauxite used for these experiments to have differed from its average composition as given by Mr. Siemens.

	SiO_2	Al_2O_3	Fe_2O_3	H_2O	
Beauxite, raw	3·5	59·2	24·5	12·1	Av. of 9 sam.
" calcined	4·01	67·89	28·09		1st group.
Beauxite, raw	1·75	39·5	45·5	12·57	Av. of 8 sam.
" calcined	2·02	45·53	52·45		2d group.
Belfast ore raw	3·5	35·0	38·0	21·5	
" calcined	4·45	44·58	48·40		
		31·26	37·74	18·06	Owners' cir.

Unless further experiments should show the adaptability of other grades of these ores than the variety used by Mr. Siemens, the apprehension of its scarcity on the part of Mr. Snelus will hardly prove groundless.

The emery ores, or aluminous magnetites, from Westchester county, Chester, Mass., and North Carolina, have a composition similar to that of the beauxite brick after being in use, except that the oxide of iron is in the form of magnetic oxide, which likewise becomes rapidly reduced in the presence of carbonic oxide. The purer varieties have a remarkably small proportion of silica, and this is probably in combination with magnesia and a small proportion of alumina, the aggregate amount of which in the form of silicates can prove no more objectionable than the clay added by Mr. Siemens to beauxite, which, in fact, contains more silica and apparently in a free state. The earthy ingredients in the non-silicious emery ore, if ground sufficiently, will probably answer the purpose of a binding agent without the addition of plastic clay.

These emery ores, therefore, seem to commend themselves for the purpose above described, and *a priori*, at least, to afford grounds for the belief that they will prove superior to beauxite or other hydrous ores of iron and aluminum of average, if not, indeed, of the best quality. The anhydrous nature of the former obviates the necessity for calcining.

A supply of a refractory and strictly basic material, as this bids fair to prove, will go far to facilitate the introduction and success of the Siemens and other direct and regenerative gas processes in this country.

Bessemer converters.—The time consumed in the repair and restoration of the refractory lining of Bessemer converters amounts, in some cases, to a fifth of the working time. The capacity of a Bessemer plant, therefore, largely depends upon the durability of this lining, and it is an object of paramount importance in all establishments to make use of such material for this purpose as best combines heat-resisting and adhesive power. Experience varies as to which of the several materials now in use is the best, and there is, accordingly, no uniformity in practice. Mr. Snelus has patented the use of limestone as a refractory material for this and other purposes. Compounds of old fire brick, plastic clay, sand, and graphite have likewise been patented.

A cement or composition of ground emery ore, with a small proportion of graphite, to which plastic clay may be added, if necessary, is particularly adapted to this purpose.

The writer has filed a *caveat* in the patent office of the United States, preliminary to patenting the use of corundum or emery in any plastic admixture, or by itself, as a refractory or heat-resisting material.

Blast furnaces.—In Lancashire and Cumberland, where argillaceous fluxes are required for the smelting of the rich red hematites of these districts, Belfast ore, or Irish beauxite, has latterly come into use as a substitute for the non-ferriferous shale of the coal measures—the object of such a mixture in this case being to supplement the deficient slag making properties of so rich an ore, as well as to saturate the uncombined silica in the ore, of which the percentage is from 5 to 7.

Aluminous ores are also employed as a flux in the smelting of silicious iron ores with the object of preventing the reduction of the silica, and the passage of silicon into the pig metal. (Percy, *Iron and Steel*, 516.) The advantage of such an application of non-silicated alumina to a highly silicious stock is well explained in a commercial circular, dated Bayswater, London, 1865, kindly brought to my notice by Mr. Abram S. Hewitt.

The object of this circular touches the practice of Great Britain rather than our own, turning, as it does, first, upon the utilization of mill-cinder, and, second, upon the ameliorating effect of clay iron-stone as a mixture either with silicious ores or cinders. In this circular it is maintained, and synthetically shown, that the result produced by the mixture of four tons of Blaenavon, Pontypool, and Lowmoor iron-stones, in equal parts, and one ton of highly silicious cinders, is in like manner accomplished by applying one ton of Belfast aluminous ore to four tons of the cinders; and that there is no difference in the proportions of alumina to silica, or in the quantities of sulphur and phosphorus.

"The addition of silicious substances to clay ironstone must reduce it more or less to a silicious standard, whereas any iron mineral, however silicious, may be brought up to the best clay ironstone standard," it is claimed, "by the application of aluminous ore."

These suggestions are without interest to ironmasters whose furnaces are within easy reach of rolling mills in some of our Eastern districts, where clay ironstones, to be sure, are neither at hand nor indeed known in practice, and where mill cinder, although easily obtained, is seldom admitted into the blast furnace. There can be no question that in this respect the economy of the blast furnace is in many cases sacrificed to the prejudice against cinders, notwithstanding their adaptability to an aluminous stock—a point well understood in Western Pennsylvania and Ohio. At the East, where the only agillaceous ores in use are clayey brown hematites, and, to a limited extent, feldspathic magnetites, the superiority of argillaceous ores, as such, is not often appreciated.

That alumina, under some circumstances, plays a part in preventing the reduction of phosphoric acid, seems to be probable, though not yet demonstrated to be a fact.

The uses above suggested for a non-silicated ferriferous ore of alumina warrant the belief that the deposits above mentioned may prove serviceable to some of our Eastern furnaces to which not only reheating cinders are accessible, but also silicious magnetites, now cautiously and sparingly applied on account of their tendency to an excess of silicon in the metal—an evil to which anthracite furnaces making gray iron from silicious, non-aluminous, or non-magnesia ores are especially liable.

It is hardly necessary to add, by way of explaining the paradox of urging, on the one hand, the advantage of such an ore of iron and aluminum as a refractory material under certain circumstances, and, on the other hand, its adaptability as a flux in the blast furnace for its refractoriness in the former case depends upon its basic properties in the absence of any considerable proportion of silica; while, in the latter case, conversely, the cinders or ores afford silicic acid to neutralize the basic alumina and produce a fusible slag.—*American Chemist.*

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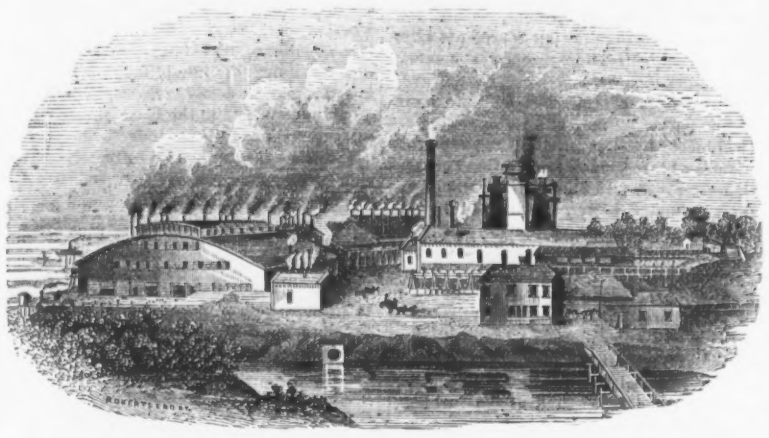

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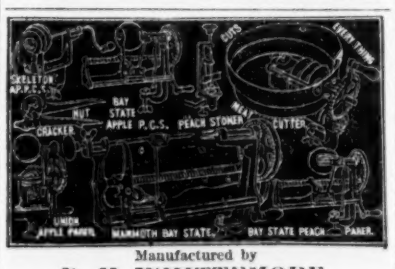

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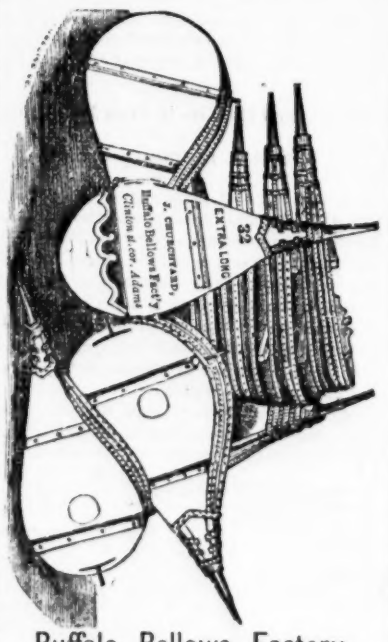

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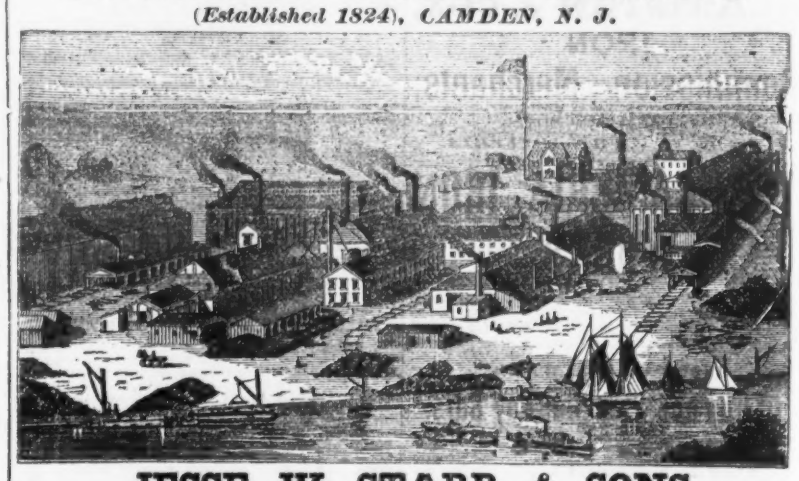

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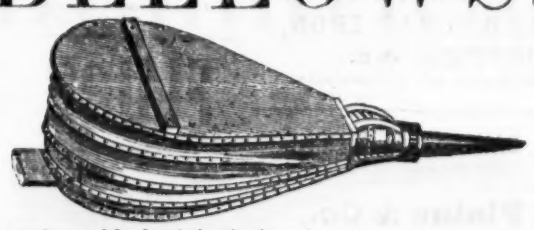

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An English View of the State of the American Iron Trade.

The *Iron and Coal Trades Review*, of February 25, publishes the following, which is interesting as showing a comprehensive misunderstanding of the subject:

The Iron and Steel Association of the States have recently held a meeting, and have spoken in the most doleful tones about the present condition and prospects of the iron trade. They have apparently circulated these gloomy statements very extensively in this country, and have even prevailed upon influential journals to accept, without dispute, the view of the trade thus set forth. Doubtless the panic exercised a temporary depressing effect upon this industry, and some time must elapse before a full recovery takes place; but it is well known that throughout the whole country very few iron making firms came to grief, and it is equally well known that English capital continues to be invited for the development of coal and iron properties, which would not be the case unless Americans themselves believed in a great future for their iron trade, for in many cases venders are willing to risk payment to themselves until a large dividend has been earned upon the ordinary capital. The fact is, however, that just now the American iron and steel makers are fearing that the free traders will succeed in obtaining a modification of the tariff, and therefore they are naturally enough making the worst of their prospects. They are even pressing to have the duties on iron and steel increased, so it will be necessary for them to make as black a case as they can. It will be seen, therefore, that considerable caution must be exercised in coming to conclusions, from statements coming from the other side, while this great tariff question is under discussion. There can be no doubt that the comparatively inexhaustible resources of America must lead to its becoming a vast iron producing country, and as fabulous profits have been made out of iron and coal properties, over and above the protective tariff, it is reasonable to assume that the requirements of the rapidly growing population of the States will lead to a large increase in the consumption of iron, and, consequently, in the manufacture of it. The statistics given by the association are also being modified by other influences. Years ago, before the means of railway communication were so extensively introduced as at present, iron was made in many places by the use of charcoal alone, in small furnaces, for the supply of the immediate neighborhood. These furnaces represent a large portion of the total number given in the list, but this method of iron making is rapidly going out, for pig iron can now be made nearer the coal fields, and conveyed long distances at a price that shuts out large quantities of charcoal iron. It is clear that yearly the production of iron will become more closely identified with the coal fields of the country, and wherever the coal and iron ore are comparatively close together, there the iron manufacture will continue to be developed as fast as markets for the produce spring up. In some of the Southern States immense deposits of iron and coal exist in close proximity to each other, but it will be a long time before there is a market for any large quantity of iron, and after a few works are erected, it will not pay to put up additional ones until the population has greatly increased. Pennsylvania itself contains vast areas of available iron ore and coal, that afford a fine field for new enterprise, and it is in this direction that we must look for the most promising extensions of the American iron trade. It would be well if English investors who are invited to place capital in iron enterprises in the States, would carefully bear this fact in mind, as it may prevent their locking up their money in properties that will not admit of being developed for a long period.

The Working Classes of Europe.

THOMAS HUGHES ESQ., M. P., Q. C.*

Report of the Co-operative Congress held at Newcastle on Tyne, 1873.
Report of the Schultze Delitzsch, Advance and Credit Societies, 1871-2.
Report of the Artisans, Laborers and General Dwellings Co., 1873.
Report of the Working Men's Clubs and Institute Union, 1872-3.

Some dozen years or more ago a ballad of considerable literary merit was popular amongst the English, on both sides of the Atlantic. Its title was "John of the Smithy." We have not heard or seen it quoted for many years, and probably there is no good reason why its memory should not have faded out of men's minds. But often when we are thinking on that many-sided problem known generally as "the labor question," the lilt of the song comes into our head. It runs:

"And the smith complains to the anvil's song,
Complains of the years he has toiled and pined;
For the priest and the ruler are swift to wrong,
And the mills of God are slow to grind.

"But a clear, keen voice comes over the sea;
It is piercing the gloom of the waning night;
Time was, time is, and time shall be,
When John o' the Smithy shall come by his right.

"And they who have forged the pitiless round,
Which has pressed him hard in body and soul,
Shall perish from earth when the grist is ground
And the mighty miller shall claim his toll."

The mills have been turning swiftly enough since that song was written, till the question is no longer whether John o' the Smithy shall get his rights, but whether he will leave any for other folk.

The reports, of which the titles are prefixed to this article, indicate four of the most important directions in which, during the last quarter of a century, what Mr. Matthew Arnold would call the *Zeit Geist*, but what we would venture to designate "the Spirit of God in man," has led, and is leading, the great masses of the European population to an era, now we trust not far distant, which, visibly realizing the noble anticipations of the English poet Laureate, will

"Ring out the strife of rich and poor,
Ring in redress to all mankind."

This birth of practical effort was preceded in Europe by an age which produced a group of remarkable writers upon the theory of social reform, among whom the names of Saint Simon, Charles Fourier and Robert Owen stand out as the most conspicuous leaders, all more or less the propounders of schemes justly called Utopian visions, embodying the bright colors of hope and desire rather than the sober tints of present possibilities; but yet visions, which, by filling men's imaginations with the notion of a state of general well-being, attainable through their own exertions, without any supernatural or revolutionary transformation of their existing faculties or circumstances, have prepared the way for the practical attempt to realize that idea which now brightens our expectations of the future. These have taken the fourfold shape indicated above; of 1. Unions of consumers or workers to carry on distribution and production on their own account, and thus to apply, for their own benefit, the profits hitherto appropriated by those who have supplied the funds employed for these purposes, and superintended their application; 2. Unions of workers to obtain the capital required for carrying on their work, by their collective responsibility, on terms as advantageous as those hitherto monopolized by the wealthy capitalists, or societies formed by them; 3. Unions of the artisan class to obtain, by the formation of clubs, the social enjoyments and advantages which the wealthier classes have obtained through similar unions; 4. Unions of the same classes to obtain for themselves healthy dwellings in convenient sites, without paying the heavy tax with which they are now burdened in the profits absorbed by speculating builders, or the greed of landlords and middle men. We propose briefly to notice what has been effected in each of these directions.

I. Co-operative associations, both for production and distribution, have spread themselves all over Europe; existing, however, in the greatest numbers, in proportion to the population, in some parts of France and Great Britain, and in the latter country alone having, up to the present time, been formed upon anything like a definite, progressive plan. This plan has rested on the proposition that consumption is the ultimate regulator of production, while it is also that which the consumers have in their own hands, and has developed from it the following theses: (1) If the consumers unite in sufficiently large numbers to pay, by the profit upon the articles which they consume, for the cost of distributing them, and provide the funds needed to purchase what they want to consume, they can free themselves from the useless burden of competing establishments set up to live by attracting their custom, and from the countless dangers of fraud and adulteration, which the keenness of the competition so caused, fosters; (2) That by uniting the establishments for self-supply thus created, as they increase in numbers, through wholesale centers, formed by the capital which these establishments furnish, and conducted by managers whom they appoint in their joint interests, they can become the conduit pipes for supplying the wants of large districts; (3) That they can thus provide a solid support to productive centers, from which these wants may be met, without needing the costly system of competitive rivalry called into operation to fulfill the same office at present. Starting from this basis, co-operation in the United Kingdom has grown till it has reached the stage where the distributive associations are beginning to feel themselves strong enough to sustain the productive societies, which should complete their work. The grave questions, attendant upon this phase of combined action—how progress in improvement can be secured, if the stimulus of competition is withdrawn? how the producing limits are to be knit to the consuming stomach without being swallowed up in, or liable to separation from it?—are commencing seriously to occupy the attention of the working classes in Lancashire, Yorkshire, the north of England, and Scotland, which are at present the chief seats of co-operative enterprise, and wait a practical solution still in the womb of the future. Without entering, then, upon any speculations of our own on the way in which this solution can be effected, tempting though that problem be, we would briefly notice three great principles to which the success of co-operation in Great Britain appears to be principally due.

The first is the rule that all dealings shall be for cash; that the distributive societies shall neither give credit, nor contract debts, except in the shape of loans for definite periods, upon the security of their assets.

The second is, that the interest on the capital employed in the business shall be limited to a moderate fixed rate, so that there shall be no speculative inducement to the formation of a class of investors with an interest in making a profit out of other men's custom; and that the profits shall be divided among the purchasers in proportion to their purchases. With this in England has been generally combined the provision that the purchaser who is not a shareholder shall receive only half the dividend he would be entitled to as a shareholder, so that the workman is thus led on to become a member of the society. The third is, that these profits shall be divided from time to time, generally once in every three months, so that their expenditure becomes a question of serious consideration. In consequence they were not exposed to be frittered away, as they certainly would have been, by a class little given before to the practice of saving, had the distributive unions among the working classes been formed upon the principle, since made popular among the richer classes in London by the civil service stores, of employing all profits beyond the cost of distribution in a reduction of price upon the articles distributed, while they could always be left on deposit at call in the society, receiving five per cent. interest if applied in paying up the instalments due upon the shares of the purchasers. Of the effect which the system of economies, costing the economizer nothing, has had upon the members of the distributive unions, some idea may be formed from a few anecdotes to be found in Mr. G. J. Holyoake's interesting account of the Great Equitable Pioneers' Society, at Rochdale, in a little book entitled "Self Help by the People." One member, who had lived in a cellar for thirty years, and was never out of debt, one morning astonished his milkman by displaying, with pardonable pride, a £5 note, the first he had ever possessed, and asking for change. Another, a woman, who was told by some enemy of the store that it would break, replied, "Well, it will break with its own, if it do break, for I have only paid in one shilling, and I have £50 there now." A third, who when he joined the society had never been out of a shopkeeper's books for forty years, in nine years afterward had paid as contributions £2. 18/, had drawn out £17. 10/7, and had still £5 left. A fourth, whose debt to his shopkeeper during twenty-five years had averaged from 40/ to 50/, and his expenditure 10/ a week, had paid into the society £2. 10/, drawn out £6. 17/5, and had £8. 3d. remaining as the result of nine years' dealings. A fifth had paid in 15/, and in the course of two years gained £18, of which he had used £11. 16/11 only. A sixth, who had generally owed his shopkeeper from 20/ to 50/, had stored up from nine years' dealings with the society £5. 1/10, out of an average expenditure of 9/ a week, having paid in as contributions £1. 18/11, and drawn out £1. 12/1. A seventh, a man above sixty, told Mr. Holyoake that had it not been for the store he did not know how he could have lived without going to the workhouse. It had nearly kept him in food by the profits on the goods he had purchased for the last eleven years, during which he had received in dividends £77. 2/6, and had still £11 left in the society. But it is needless to multiply instances. Those already given may suffice, to illustrate the important improvement in the actual conditions of members of the working class, even those in the receipt of comparatively small earnings, from the profits upon an expenditure by no means embracing, at the time to which these statements relate, all their outlay—for the Rochdale pioneers did not then supply many articles now included in their stock, and had but recently begun to supply others, while they will explain the causes of the growth of co-operative business and capital shown by the following figures, extracted from the report of the conference at Newcastle, and compiled from the government returns for the years 1866-7-8, '70, and '71.*

SOCIETIES REGISTERED AT END OF YEAR.	1869.	1867.	1868.	1870.	1871.
Of which, had made returns to which the following figures apply	839	96	956	969	
Members at end of each year	436	577	670	740	962
Share capital " " "	174,993	171,897	208,738	249,119	364,188
Loan capital " " "	1,016,810	1,475,199	1,622,776	2,084,201	2,315,951
Goods sold during year	118,024	136,754	184,163	197,138	215,588
Goods sold during year	3,892,766	5,377,362	6,160,406	7,467,741	9,439,611
Expenses, including interest, depreciation	4,446,676	6,001,153	8,118,072	9,292,436	9,439,611
Liabilities, total, at end of year	295,594	311,238	349,039	313,237	388,721
Assets " " "	1,383,899	1,560,245	2,027,747	2,403,962	2,866,318
Cap. inv'd in other societies or companies		1,588,616	2,155,117	2,640,456	3,025,762
Net profit during year, after payment of interest on capital	372,207	398,678	495,542	553,478	670,721
Declared due to members on purchases			357,380	467,164	583,260
" " non-members			12,676	16,523	16,218
Appropriated to educational purposes			3,676	8,775	5,997

The year 1872, so far as its returns are known, shows a similar rate of increase; the sales of 75 of the largest societies, which in 1871 were £3,730,349, having in 1872 reached the total of £5,032,787; while the number of their members had risen from 77,520 to 86,234; and their share capital had increased from £895,627 to £1,129,300.†

In the meantime the advance of the second stage in this organized system of self-help, the wholesale centres by which the distributive action of the individual societies may be concentrated, has been not less striking. In 1864 the co-operative wholesale society, then called the "North of England Wholesale," commenced its business at Manchester, and effected, during its first complete half-year, sales to the amount of £45,895. In the three months ending 1st July, 1873, the sales were £339,011, being an increase of 50 per cent. on the corresponding months for 1872; while 86 new societies had joined it during that quarter,‡ and this irrespective of the members of an allied society, the "Scottish Wholesale," established at Glasgow, which, in the year 1872, effected sales amounting to £262,581, an increase of 61 per cent. on the previous year.‖

(To be continued.)

* Condensed from the *International Review* for March.

* Those for 1869 are wanting.

† Co-op. Congress Report, page 119.

‡ Co-operative Wholesale Society Report, July, 1873.

‖ Letter to R. Kettle, Esq., Co-op. Congress Report for 1872, page 115.

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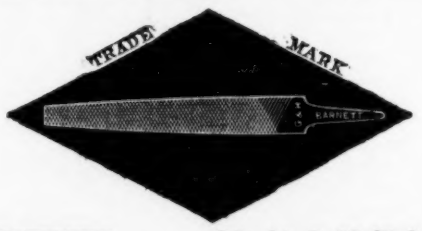

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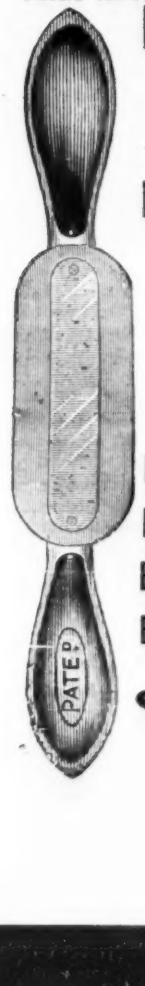

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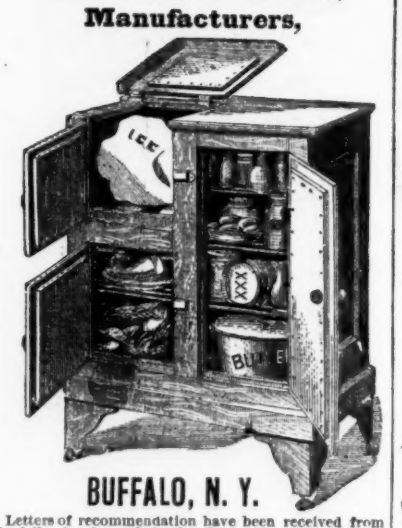

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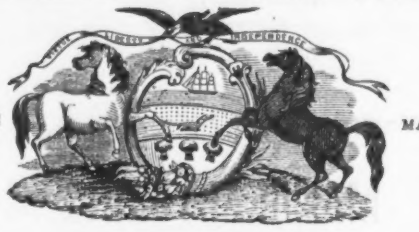
TRADE  MARK

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BUSINESS ITEMS.

PENNSYLVANIA.

Rawle's furnace, Sharpsville, has been blown in.

A new blast furnace for the manufacture of pig iron is about to be erected at Sheridan, in Berks county, and is to be supplied, if the Reading *Times* speaks truly, with new and hitherto not generally adopted appliances. It is needless to state that the new furnace will use anthracite coal. The blowing tube for the furnace weighs 18,500 pounds.

The Fanny Furnace, at West Middlesex, Mercer county, is making 200 tons No. 1 Foundry iron weekly.

The Walton Manufacturing Company, of Erie, have made propositions to the business men of Girard, looking to the establishment, in that village, of works for making its patent wrench.

Elizabeth Furnace, Blair county, was blown out on the 21st ult.

The employes of the railroad shops at Altoona are working on full time.

The blast furnace at Erie, which has been idle since July last, is being prepared for manufacture of charcoal iron.

It is understood that the Allentown Rolling Mill Company has the contract for furnishing the Lehigh Valley Railroad with 7000 tons of rails, to lay a single track on the extension to New York.

The new steel rail mill, at South Bethlehem, has been started.

The Keystone Bridge Company has been awarded the contracts for 13 spans of double track iron bridge on the Easton and Amboy Railroad; for 5 spans of iron bridge near Defiance, Ohio, for the Baltimore, Pittsburgh and Chicago Railroad; and also for 20 spans of iron bridges, to be completed by September 1, on the Baltimore Short Line Railroad.

About the year 1769 a few tons of grindstones were imported from Newcastle-on-Tyne, England, to Philadelphia, consigned to Joshua Fisher & Sons. From this small beginning Philadelphia has become the headquarters of the grindstone trade. Over 2000 tons are kept on hand, and improved machinery driven by steam power is used for hanging and finishing them. For the various purposes of sharpening machinists' tools, grinding off of the iron work of locomotives, and grinding pulleys and spindles, shafts with self-adjusting plates are now used, which prevent the stone from bursting. All of these can be had at the old establishment of J. E. Mitchell, founded in Philadelphia in 1810.

MAINE.

The Camden Anchor Works, at Camden, were established in 1866, by the present proprietors, H. E. & W. G. Alden. These works cover two acres of ground, contain three large hammers, with other necessary machinery, and give employment to 50 hands. Their product comprises windlass necks, truss-shapes, anchors and chains, &c. Anchors constitute the specialty of the firm, who manufactured the first of large size ever turned out east of Boston. Their anchors bear a high reputation among shipbuilders, and are in use at all points along the coast. The revival of the shipping interest has stimulated ship building in Maine to a degree of activity not reached for many years, and the demand for the anchors, &c., manufactured at these works is unusually brisk. The machinery in use by the firm is of the latest and most efficient kind, and is driven by a never-failing water power. These works contribute largely to the business prosperity of Camden, and are admirably managed by the proprietors.

The Lewiston Machine Company are now giving employment to 180 hands. They manufacture cotton machinery in great variety, making a specialty of the celebrated "Thomas Loom," of which they have the exclusive right to manufacture. Their works cover about 5 acres of ground. Their machinery is driven by a steam engine of 60 horse-power, built by Corliss, of Providence, R. I. This company are also manufacturing the celebrated "Follensbee Double Propeller Pump," which, for the purpose it is designed, cannot be surpassed in the country. The casing of this pump consists of a number of alternate vertical and inclined flanged sections, screwed together by bolts. The shafts are caused to turn in contrary directions. The propellers of one shaft are in the form of a right hand screw thread, while those of the other shaft are formed like a left hand screw thread. The whirling of the water by one propeller is counteracted by the next propeller above. The peculiar feature of this pump is its simplicity of construction, having no valves, and costing much less than any other pump of the same power; it will lift sand, mud, tanbark, &c., without interfering with its efficiency, and requires no oiling; it will elevate water to any hight. This pump will lift a full column of water with from 30 to 50 per cent. less revolutions than any other propeller pump now in use, owing to the double action of the propellers. The Lewiston Machine Company are manufacturing these pumps of the following sizes, viz: 3, 6 and 8½ inches, ranging in capacity from 200 to 1800 gallons per minute, and can make other sizes increasing the capacity to 20,000 gallons per minute. Mr. G. S. Follensbee, the efficient agent of the Lewiston Machine Company, is the inventor of this pump.

MASSACHUSETTS.

The Wason Car Company, of Springfield, are building a lot of smoking and mail cars for the Housatonic Railroad Co.

The tack factory at Lakeville, which was burned down not long ago, has been rebuilt, and business will soon be resumed.

NEW HAMPSHIRE.

The Manchester Locomotive Works is one of the first establishments of the kind in the country. These works were founded in 1854, and have a capacity equal to the manufacture of 175 machines a year. The shops include a machine shop 400x86 feet, two stories; a forge shop, 360x40 feet; a boiler shop, 350x60 feet; beside store houses, etc. Steam-power is furnished by two engines, one of 150 horse and the other of 40 horse. The shops have a capacity for working 700 men, but only 320 men are now employed. About 700 machines made by this company are now running in different parts of the country. The Michigan Central, and Chicago, Burlington and Quincy, are the roads which use them.

ILLINOIS.

The Catasauqua *Dispatch* publishes the following: The furnaces at this place are being repaired for relighting, but when that time will come is hard to determine. The Thomas Iron Co. have several furnaces ready for work, but during the present stagnation of the trade, orders have been given to await further developments. So with almost every company. The stock on hand will supply the demand at present made. Manufactured iron is correspondingly dull, and but few orders are being filled. The rolling mill at this place was idle several days in order to make repairs to water pipes.

OHIO.

The puddle mill of the Girard Rolling Mill is not in operation, and it is said that Eastern parties are negotiating with the company to put in more capital. It is understood that the capital stock will be increased from $100,000 to $200,000, and there will be added to the mill more puddle furnaces and additional works for the manufacture of nuts and bolts.

The Pomeroy Nail Mills are running day and night.

INDIANA.

The Pennsylvania Railroad Company is making arrangements to build car shops, a round house, and other buildings at Vincennes.

A coal cutting machine has been introduced into a coal mine near Brazil, which, driven by a five horse-power steam engine, will, by trial, save 35 cents per ton in expense of mining over the cost of hand labor. It is a rotary cutter four feet in diameter, cutting three feet four inches into the vein before requiring readjustment.

Evansville has shot works, in which shot is made by a new process invented by one of its citizens. The process consists of compression, and does away with the tall tower heretofore employed.

ILLINOIS.

The project of a rolling mill at Belleville is again being agitated, and stock subscriptions to the amount of $18,000 have been already secured.

The new malleable iron foundry, at Chicago, the second in size and capacity in the country, commenced operations on the 23d ult., with a small force, to test the machinery and appurtenances. In a short time it is expected the foundry will be in full operation, giving lucrative employment to 600 workmen. The amount of capital invested in the building and equipment of the foundry is not much less than $1,000,000.

Estimation of Sulphur in Iron and Steel.

Prof. Thos. M. Drown, of Philadelphia, says, in a paper read before the American Institute of Mining Engineers:

The method usually employed in accurate determinations of sulphur in pig iron and steel, is to treat a weighed sample of borings in a flask with muriatic acid, and to pass the gaseous products through an alkaline solution of lead or silver, which precipitates all the sulphur of the sulphuretted hydrogen in the form of sulphide of lead or silver. The sulphide thus formed is subsequently oxidized by aqua regia, bromine, or other oxidizing agent, and the sulphuric acid formed, precipitated in the usual way by chloride of barium.

I have substituted for the alkaline metallic solution, a solution of permanganate of potash, in the strength of 100 grammes of permanganate, to 200 cub. cent. of water, and find that it gives results quite as accurate as those obtained by using an ammoniacal solution of silver. By the employment of the permanganate, it will be readily seen, that there is considerable saving of time and work. In order to test the accuracy of the method, six samples of pig iron borings were weighed out (about six grms. each), and treated identically in the same way, with the exception that with three an ammoniacal solution of silver was used, and with the remaining three a solution of permanganate of potash. The sulphide of silver formed was filtered and oxidized by bromine water. The residues, after treatment with muriatic acid in the flask, were invariably filtered off and washed, then evaporated twice to dryness, with aqua regia, taken up with muriatic acid, filtered, and the filtrate added to the main solution containing the sulphuric acid. In using the permanganate I have found it necessary to avoid a very rapid evolution of gas. It is also necessary to pass the gas through at least three tubes or bottles containing the solution of permanganate. The gas then gives not the slightest blackening when passed into a lead or silver solution. After the evolution of gas has completely ceased, and air has been drawn through the apparatus for some time, the contents of the bottles are poured into a beaker, rinsed out with water, and any oxide of manganese adhering to the sides, or to the tubes, dissolved in a little muriatic acid. Enough muriatic acid is then added to the beaker to completely decompose the permanganate, and convert it into a clear, colorless solution, in which the sulphuric acid may be directly precipitated. If the solution does not become perfectly clear, owing to impurities in the permanganate used, filtration is necessary before precipitation.

The following are the results obtained by the two methods:

With silver solution.	per cent.	With permanganate.	per cent.
No. 1	0·100	No. 4	0·093
No. 2	0·093	No. 5	0·098
No. 3	0·099	No. 6	0·091

The sulphate of baryta, after weighing, was fused with a little carbonate of soda and potash, and the sulphuric acid reprecipitated, giving:

	per cent.		per cent.
No. 1	0·0900	No. 4	0·0880
No. 2	0·0890	No. 5	0·0820
No. 3	0·0920	No. 6	0·0850
Mean	0·0903	Mean	0·0883

The difference in the two means is but 0·002 per cent.

The pig iron used contained an unexpectedly small amount of sulphur. It was made from a brown hemitite resembling a bog ore, occurring in vast quantities at Katahdin Furnace, Piscataquis county, Maine, containing three per cent. of sulphuric acid.

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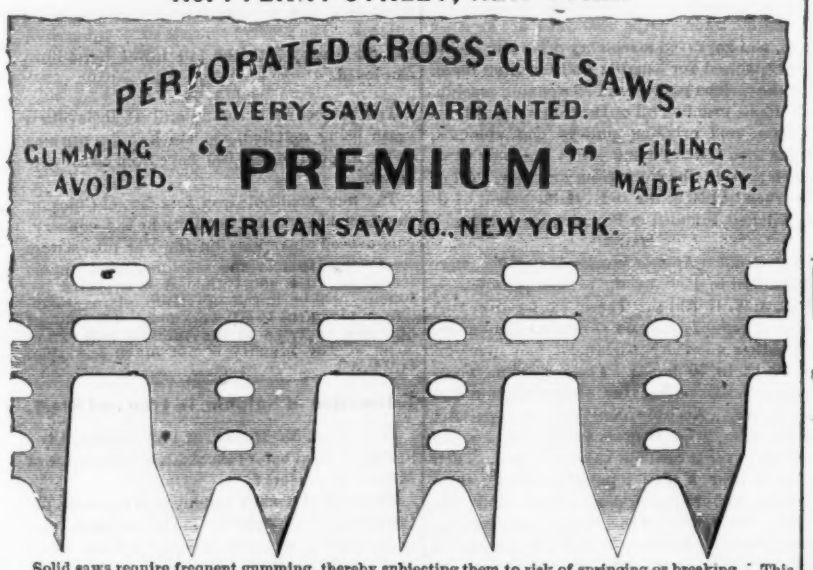

Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This especially the case with cross cuts having *Patent Teeth*. In the perforated saws **all gumming is avoided.** and the teeth are easily kept long and in *proper shape*, saving *files, labor, expense* and *vexation* As is well known, our saws cut faster, smoother and easier than any other.

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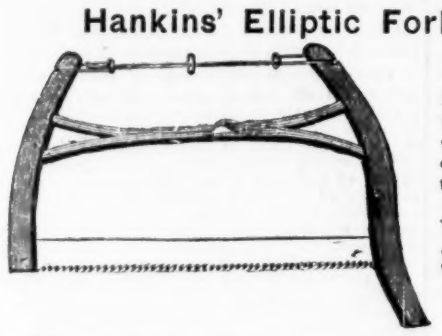

The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any centre bolt, secures for the Frame great strength and durability.

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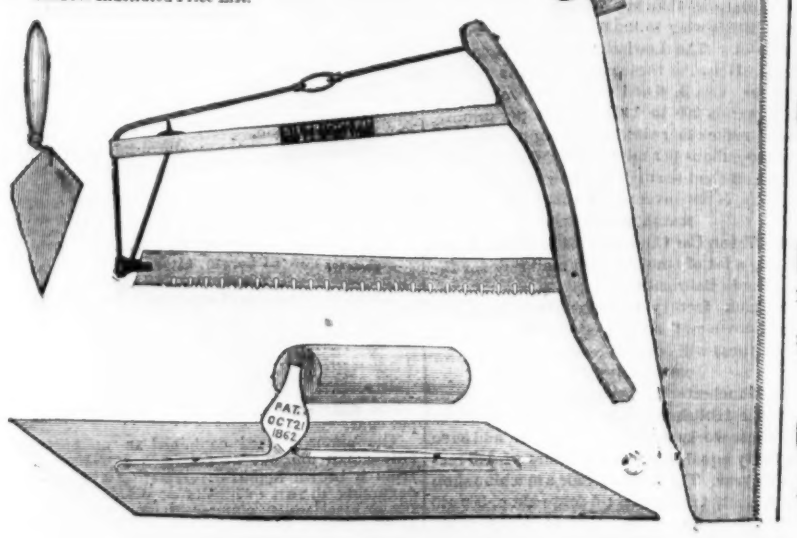

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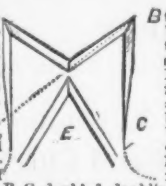
I have hundreds of letters from practical sawyers, voluntarily written, expressing their entire approval of these Saws.



A, B, C, represents a common drag saw tooth for cutting in one direction only, for wood sawing, and is equal to both cutting edges of **M** tooth are B, C, doubled. doubling the cut of the tooth A, B, C, or the tooth E, without loss of space.

B the common **V** cutting tooth E, of same space. B.C. is equal in its direct action, to both faces of **V** tooth, consequently the two faces of my

This is produced by dressing the two points of my **M** tooth, to cut in line so that the outside B, C, has four times the space of the slant edge behind it, or from 1 to 5, while slant has space from 1 to 2, the inefficient slant edges are thus practically concealed and do but slight surface cutting, while B, C, edges cut and clear simultaneously.

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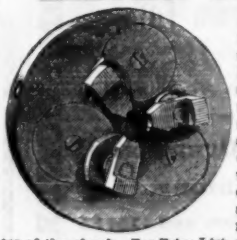

We invite attention to the superior construction of this chuck. Its working parts are **absolutely protected from dirt and chips.** It is strong, compact and durable, and will hold the greatest variety of work, as the jaws are adjustable with a range the full diameter of the chuck. For Price List, address,

Lambertville Iron Works, Lambertville, N. J

Iron and Coal in Jackson County, Ohio.

The Cleveland *Commercial Review* says:

Some wonderful developments, it seems, have recently been made in Jackson county, in this State. If the facts are as represented, and we see no reason to doubt them, it is no longer a question where iron can be made in this country most cheaply. With all the materials required to make pig iron conveniently located by nature together—the best of iron ores, good limestone, and a stone coal that, for smelting purposes, is fully equal to a bed of charcoal—it is not surprising that good foundry iron can be produced in Jackson county for $1·5 per ton.

This iron field is in what is known as the "Hanging Rock" region. The iron ores and limestone found there is no new discovery, but it is the peculiar quality of the newly discovered coal that is so remarkable. Charcoal blast furnaces have existed for many years in Jackson county, but only recently has the great value of the coal for smelting purposes been known. When it is stated that it will make one-fourth more, and better, iron than the stone coal of the Mahoning Valley, our readers will understand its great value.

Starting from Hamden, a point on the Marietta & Cincinnati Railroad, 128 miles east of Cincinnati, the Portsmouth Branch Road (Hamden to Portsmouth on the Ohio River) soon touches the northern line of Jackson county, and at once enters the region where this coal is found. Other valuable coal seams are also found there, but none other can be used for smelting ores in its raw state. The iron ores are found in almost inexhaustible quantities and of several varieties—the best of which is known as the limestone, from its juxtaposition with a valuable deposit of gray limestone that is used for fluxing. These iron ores give an average yield of 40 per cent. of iron; cost of ore delivered at the furnaces, $2·50 to $3 per ton; cost of limestone, $1 per ton.

But with all the advantages of good and cheap iron ores and limestone, Jackson county would have no superior advantages as an iron producing district were it not for the most remarkable stone coal of which we have spoken, which is found at a depth of from 50 to 100 feet under the surface. This is her chief advantage—a pure, dry, free burning coal, almost absolutely free from bitumen or tarry matter or sulphur, and can be used just as it comes from the mines, in its raw state, for smelting the ores, and seems to answer just as well as charcoal itself, and at only a small part of the cost. The results of a careful analysis of this coal, recently made by a gentleman of this city, show only 4-10 of 1 per cent. of sulphur, and only 6-10 of 1 per cent. of ash.

The cost of this coal delivered at the furnaces is $1 to $1·12 per ton of 25 bushels—amount required to make one ton of iron, 2¾ tons.

It was at first supposed that this coal deposit was of a merely local nature, and confined to the immediate vicinity of Jackson Court House, where at this time five furnaces are now using it for smelting purposes; but during the past six months it has been found along the line of the Portsmouth Branch Road, between Jackson Court House and Hamden. Already several blast furnaces are in process of erection, and quite a number projected. The town of Wellston has been laid out on the Bundy farm, and bids fair to have a most marvelous growth. Capitalists from Columbus, Dayton, Springfield, Xenia, Washington Court House, and other points, attracted by the superior advantages of this locality as an iron making district, have already invested in these lands. No wonder, for even at the present low price of iron, the prospective gains are simply enormous. A double furnace, with a capacity to make 40 tons of iron daily, will more than pay for itself each year, and while these lands are now selling at from $150 to $300 per acre, their real value is far more, and, doubtless, they will very soon bring a much higher price.

The experience of iron masters in Europe proves that to make iron cheap, it must be made in close proximity to cheap fuel. In Scotland, Staffordshire, South Wales and other iron districts in coal fields, iron masters have prospered for the simple reason that they have cheap fuel alongside prolific iron ores, and in Great Britain no iron works now prosper but such as are in coal fields, or have cheap fuel. All the iron works that formerly existed in the Wealds of Surrey, Sussex and Kent (and more than one-half of the English iron works were located here at one time), had to be removed to the coal fields. Too many of the iron works of this country, outside of coal fields, have their profits eaten up by freights on the raw material. Only think for a moment—a furnace built outside of the raw material, has to pay freight on six to seven tons of material, and then pay freight to market on its iron. Whereas, a furnace built in the midst of the raw material has only to pay freight to market on one ton of iron. When the price of iron is so low that furnaces built outside of the raw material are forced to go out of blast or lose money, furnaces built in Jackson county can make iron at a clear profit of $10 per ton. For in that locality not only are the best of iron ores and limestone found together with fuel, but that fuel a stone coal that will make good foundry iron in its raw state at a cost so low as to make rich those who are lucky enough to engage in the business. Whether this newly discovered coal is extensive enough to work a revolution in the price of iron remains to be seen. Any considerable reduction in the cost of iron, in general, would help this country very much. It would give a new impetus to the building of railroads and to business in general. But we fear this new and cheap iron district is of a limited character, and will have no appreciable effect on the market price of iron, and that the only result will be to make fortunes for those operating furnaces there.

One road, the Portsmouth branch of the Marietta Railroad, now reaches Jackson county, and another, the Dayton and Southeastern Railroad, is projected and under contract. Another short road, tapping the Hocking Valley road at Logan, is projected, and will probably be built this summer. The completion of these routes cannot fail to rapidly develop this region, which certainly offers a most tempting invitation to investment.

Improved Ratchet Bit Brace.

No class of mechanical tools have been more improved during the past ten years than bit braces. Until the Barber Brace was put upon the market in 1864, all bits had to be fitted to the braces in general use. Now all saleable braces will hold bits without fitting. At first it was a little difficult to make braces center and hold perfectly tool shanks which were themselves very imperfect. But much improvement has been made in that respect by bit manufacturers so as to obviate the difficulty. Two or three hundred bit brace patents have been granted, but only two or three of them are much in use, and the manufacturers of these are engaged in a long and expensive patent suit to determine their respective rights. The main objection to the use of a brace has been that the sweep could not revolve in many places where holes have to be bored. To overcome this difficulty auger borers and extension bit holders were resorted to. But a bit brace has lately been invented which will, by a ratchet movement, bore in places where the sweep cannot revolve.

This ratchet brace has the same chuck and steel jaws as the common Barber brace. It also has, as seen in the cut, a ratchet wheel, with pawls operated by a coiled wire spring, so arranged that when a ring or sleeve, with a cam arrangement inside, is turned one-fourth around upon the free end of one pawl, it lifts the other end from the ratchet wheel and lets it revolve by the operation of the other pawl, so as to drive the bit into the wood. When the bit is to be withdrawn the ring is turned back over the other pawl so as to reverse the ratchet. When not wanted for a ratchet the ring is turned so as to let both pawls fall into the ratchet wheel, thereby making a stationary brace. All the working parts are made of cast steel. The head is *lignum vitæ*, the revolving center piece of rosewood, the sweep of wrought iron, highly polished, making a very beautiful and useful brace. The ratchet attachment adds only 50 cents to the retail price of the brace. At present the Millers Falls Co. are the only manufacturers of ratchet braces, they having purchased all the patents covering that improvement.

The Behavior of Iron under Vibrating Shocks and Strains.

Mr. W. Mattieu Williams makes the following contribution to the literature of an important subject, so ably and thoroughly discussed in these columns some months ago by Professor R. H. Thurston:

A great deal has been written and spoken concerning the molecular changes produced in iron by vibration, and many instances are cited of iron that has shown a crystalline fracture after long exposure to vibratory disturbance. But those who theorize upon the so-called molecular changes due to such action, base all their conclusions on a few exceptional facts, and apparently forget the multitude of other facts which contradict their theory. Ordinary experience shows that good iron remains fibrous throughout its substance after years, and even centuries, of considerable vibratory wear and tear. This broad general fact throws much suspicion on the isolated cases of crystalline structure attributed to vibration. If vibration is a true cause of crystalline structure, then crystalline structure should follow as an invariable consequence of vibration. This is certainly not the case, and, therefore, where the crystalline structure has been occasionally found, we should look for another cause. This, I think, is not difficult to find, viz., in the original bad iron. It is no reply to this to point to the fact that one part of the piece of iron in question was fibrous, and the other portion that is supposed to have suffered, or really may have suffered, more vibration, was crystalline, because, as every practical ironworker knows, we may find fibrous and crystalline iron, not merely in different fractures of the same bar, but even in different portions of the same fracture. Inferior, ill-worked iron is especially liable to such irregularities of structure. The theory that localized crystalline structure is produced by vibratory action may sometimes be very convenient for contractors, but I doubt whether it has any reliable foundation in fact.

The above remarks must not be understood as implying that vibratory shocks may not weaken iron. There are many incontestable facts which prove that a vibratory shock, if sufficiently violent, certainly does affect such weakening. I need only refer again to the trials of armor bolts by the falling test, described in my last paper. Here we had a definite force applied as a sudden shock, a weight of one ton falling 30 feet. The first blow is resisted by the best iron, the second blow also, likewise the third; but on applying the same amount of force in the same manner a fourth time, the iron yields, showing that the previous shocks had weakened it, and rendered it unable to resist a blow that it was previously able to bear.

But was this weakening due to the development of crystalline structure? Certainly not. The alteration of structure indicated by the best iron was rather in the opposite direction. The "distress" exhibited after the first blow, and more and more obviously displayed after the second and third, presented the appearance of a dragging or stretching out of the fibers, a sort of exaggeration of the normal fibrous structure of the iron. In those parts where the extension and consequent reduction of diameter was the greatest, the fibrous structure of the iron was to a certain extent visible on the skin of the metal, and the final fracture of the best samples had a brush-like character, due to this dragging out or exaggeration of fiber. These appearances are also observable when the best iron is broken by a gradually applied tensile strain, and may be studied in some beautiful samples of fracture that are preserved by Mr. Fairbairn.

It is true that in these cases the strain has been exerted only in one direction, and doubtless the effect would have been different had its direction varied, but what would be the extent of this difference? Merely, I suspect, to neutralize the dragging out or exaggeration of fiber, but not to substitute for this another and very different action—viz., the development of crystalline structure. I do not at all question the conclusion that a long continuance of small vibratory shocks may probably weaken iron or steel by gradually effecting a similar "distress" to that so plainly exhibited and suddenly produced by the violent shock of the falling test, but do maintain that we have no sufficient or even approximately sufficient evidence in support of the theory that vibration can convert fibrous into what is called crystalline iron.

A further and full experimental investigation of this subject is imperatively demanded, and may readily be made. Cut a good plate or bar into, at least twenty equal pieces; shuffle them well, then take ten and ten. Let the first ten be laid aside in a quiet place, and the other be exposed to continuous and sharp vibration for a year or two. Attaching them to a tilt hammer regularly used for shingling the fagots of blistered steel, and making about 300 strokes per minute, would do very well for this purpose. Then let each two be tested for tenacity, and their average tenacity compared.

I say at least twenty, because all wrought iron is more or less variable in cohesive power at different parts of the same plate or bar, and thus the more numerous the trials and broader the average, the more reliable the result; and "shuffled," because if one set were all middle pieces, and the other all side or end pieces of the plate or bar, the trial would be delusive.

There is another and very curious question connected with this subject that also demands similar investigation, its practical and philosophical interest being considerable. It is whether iron and other inanimate substances are susceptible of becoming weakened by "fatigue," and of recovering in some measure by repose. Many may smile at the bare suggestion of such a question, but it is not so ridiculous as it may appear. Intelligent workmen, whose daily experience constitutes the broadest of experimental data, assert that the tilt hammers of steel works, which work with the greatest rapidity, rapidly give way near the axis unless they are allowed intervals of rest. I have never had an opportunity of veryfying this or any other similar cases, but, nevertheless, see no good reason for discrediting it, nor any great difficulty in understanding how it may occur. When iron, steel, or any other elastic substance is subjected to a gradually increasing strain, the first indication of distress is an elastic extension, that is an extension which is partly or wholly recovered when the straining force is removed. Now, let us suppose that the total breaking force in any such case is $=a+b$, where a is the amount of force sufficient to produce an elongation recoverable by elasticity; it is evident that when the substance is in this condition, the strain by which it may be broken is a smaller force than when, in its normal state, it is b instead of $a+b$, or, otherwise, it is weaker in this condition than when at rest. If, then, the recovery from the state of elastic strain is not instantaneous, but demands some time, a period of rest equal to that time is demanded, in order that the strained material may recover from its fatigue. The question is thus reduced to whether complete recovery by elasticity is instantaneous or occupies some time, and how great is that time? Also whether this period of recovery varies with different substances? There can, I think, be little doubt that an appreciable time is demanded, that the length of that time varies considerably, and is intimately connected with that internal friction which has been described as molecular viscosity.

The effect of temperature on the stability of iron and steel has been recently treated rather fully in *Iron*. Putting all the reliable experiments and other data together, I think I may venture to generalize to the extent of saying that lowering of the temperature of iron or steel affects its powers of mechanical resistance in nearly the same manner as the addition of carbon, silicon, or phosphorus, the resemblance being nearest to the action of phosphorus.

If this is correct, then the effect of intense cold on iron or steel will be to increase its brittleness when subject to a vibratory shock, while it increases its tenacity as tested by a gradually applied and steadily increasing strain, and the effect of raising its temperature is the converse of this *i. e.*, a given sample of iron will be less liable to fracture by mere vibration when hot than when cold, and weaker when tested by a steady pull. I may also venture to express my belief that the presence of sulphur, within certain limits, tends to mask this difference, but not to fully counteract it, while phosphorus, silicon, and carbon materially exaggerate it. Or, in other words, sulphur diminishes the differences due to a given variation of temperature, while phosporus, silicon, and carbon increase it.

Those who have studied this subject and are disposed to prosecute it further, will, I think, find in the above inductions an explanation and reconciliation of most of the apparent contradictions which recorded experiments present.

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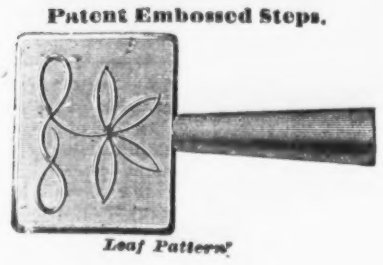

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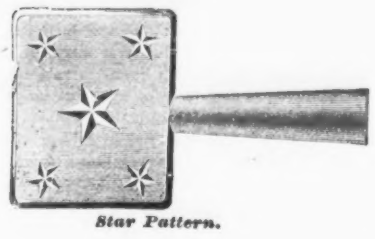

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Smith's Improved Philadelphia Pattern Slat Irons.

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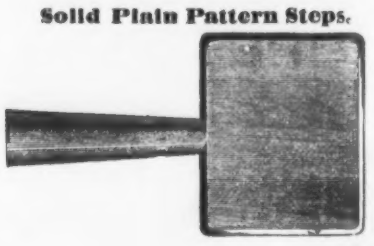

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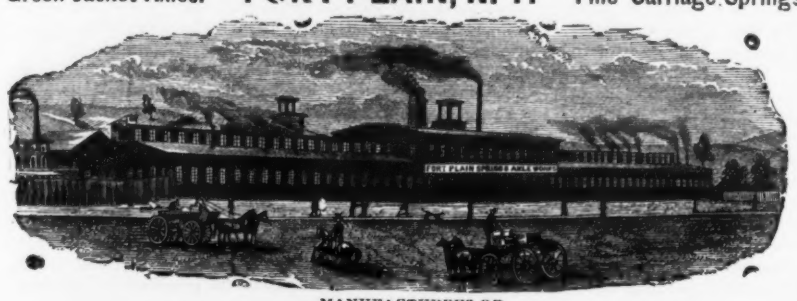

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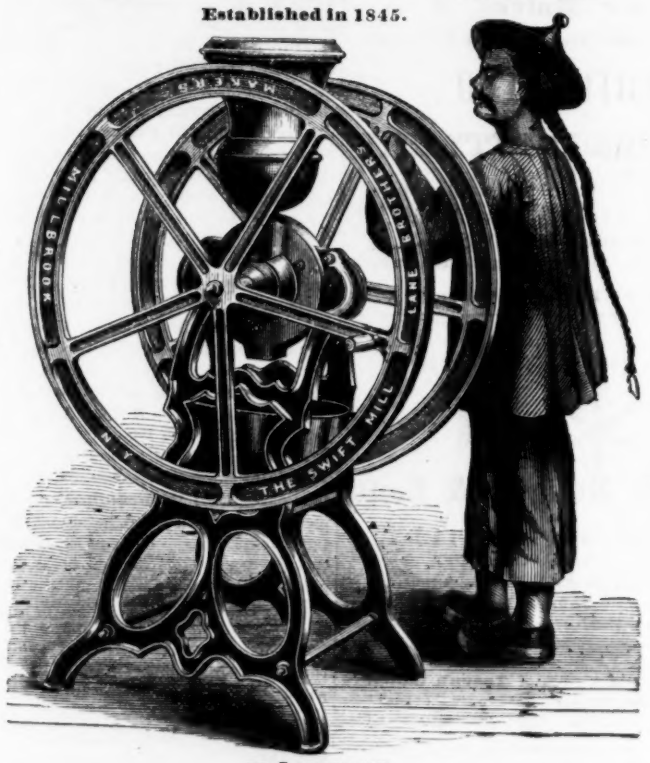

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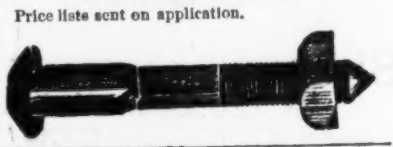

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CONTENTS.

The "Council of Foreign Bondholders."

An association has lately been formed in London, under the auspices of the British Board of Trade, which is likely to have a very seriously adverse effect upon the investment of English capital in American iron and coal lands. This is the "Council of Foreign Bondholders," which proposes "the vindication and protection of "the rights and interests of the holders of "foreign bonds, and the maintenance of "the public credit of foreign governments, "by the propagation of sound doctrines "with respect to the punctual fulfillment "of their financial engagements, especially "toward foreign creditors." The Council reviews the monetary condition of numerous defaulting countries, but we are only concerned with that portion which refers to several of the United States. These States are Virginia, West Virginia, Georgia, Tennessee, Indiana, North Carolina, Florida and Louisiana. The State of Virginia, through its citizens, is just now striving to secure English capital for the development of her valuable coal and iron interests. These efforts the council have resolved to oppose, discouraging in every way such investments, and declaring this "a measure of common prudence, because "no private investment can be safe where "the obligations of justice, morality and "laws are set at defiance by the com-"munity." This is a matter of very grave importance to Virginia landholders now looking to foreign aid for the capital which cannot be here obtained to develop their minerals, and it should stimulate the Legislature of that State to prompt action in making provision for its indebtedness. Not only is this Council prepared to oppose the investments of English capital in States where unpaid principal or interest is claimed, but they "have not been unmind-"ful of invoking the attention of their Con-"tinental allies to the common danger, &c." "It is to be remembered this Council controls the heart of the London money market, and that their report is not without its influence may be seen from the late failure of two prominent American iron manufacturers to induce the investment of English capital in extensive and well managed works in this country. All the States named above come in for their share of reprehension, but Virginia, West Virginia and Tennessee are the most severely handled, the last of which, "cannot be ac-"cepted in the future as a solvent borrower "by those in the United States, or abroad, "beyond its own frontiers." The result will, very probably, be the exclusion of Tennessee from the privileges of the markets.

A great deal of this may be set down to the very natural feeling of soreness on the part of creditors who are denied payment of their loans, but that it will have a serious effect upon the prospects of those who now have mineral properties upon the English market cannot be doubted. The facility with which State and railroad loans have been placed upon foreign markets, and the culpable looseness with which State credit has been loaned to railroad speculations, has borne the natural fruit. We see in the report of the Council alluded to, the first effect of this. In the future the effect will be more serious, since really meritorious enterprises seeking foreign capital will be denied such aid, and the extension of our industries will thus be retarded. It may be urged that these industries should rely upon American capital for their extension, and that when the proper time arrives they will receive the requisite aid. But this is not so, nor can it ever be. The extent of our country, its comparative youth, and the struggle in competition with the older nations, precludes the possibility, under any system of finance yet suggested, of an abundance of capital equal to our necessities in this line. So long as we are aware of the possession within our borders of the raw material to supply ourselves and the world with a product of such prime necessity as iron, it behooves us to use every effort to obtain the means of developing and utilizing our resources, and thus to increase our population, extend our industries and add to our prosperity. Moreover, the American capitalist too frequently prefers the large gains of speculation, even with its greater risks, to the safer, if somewhat slower, returns from real and industrial investments of capital. The surplus millions will oftener seek rapid employment in Wall street than certain increment in developing well chosen and well worked mineral lands. Lower rates of interest and greater habits of thrift abroad, have taught foreign nations that the investments we neglect are the safely profitable ones for the future. From the abundance of forcign lands we have borrowed largely for speculative and unprofitable, because unnecessary, operations. Now, when legitimate industry seeks capital, it is shunned, because of the failure of these unwise ventures. The loss will be the more seriously felt as the need grows greater.

The remedy is obvious, and consists in a rigid system of self sacrifice, by economy and taxation, upon the part of State governments, until every dollar of their foreign indebtedness shall be wiped out and their credit restored. It is useless to plead the advantage of American investments in the face of an opposition as powerful as that which the Council is capable of exerting, and confidence once destroyed cannot easily be re-established. The time will come when British and Continental capital will prefer American investments in mining lands to any others which can be offered, and many wealthy houses with American connections will continue investing, because they know what they are getting for their money; but the aggregate capital which will thus find its way into the country is not great. Meanwhile, through our former folly, we are prevented from competing as we might for the supremacy of trade, and are compelled to purchase at high rates what we could well supply from our own resources. The subject recommends itself strongly to the law makers of the States named.

The Statistical Position of Copper.

The copper markets of this and other countries present at this time features of universal interest. The decline in London of £6 per ton for Chili bars, and as much for English ingots, is probably due in a great degree to the demoralization resulting from the failure of several prominent houses in the metal trade early in the year, and not to causes affecting copper alone. The heavy decline in the price of tin, noted in our issue of March 5, has, no doubt, affected a good many holders of copper also, and created a general distrust, which pervades all branches of the metal trades. Straits tin opened at £115 on the 1st of January, and on Saturday last was quoted, according to our cable advices, at £94. The causes which operated to reduce the price of tin were not difficult to trace, and were set forth with sufficient detail in the article above referred to. The decline in Copper, however, is a matter more likely to occasion some surprise, as the statistical position of that metal showed some remarkably strong points at the beginning of the year, as will be seen from the following:

		1874.	1873.	1872.
Stock at London, Liverpool, Swansea and Havre, and afloat from Chili Jan. 1st.		36,011	42,278.	30,054
Price January 1st.	Tough....	£91	£96	£91
	Bars.....	83	91	85
" February 28th	Tough....	86		
	Bars.....	77		

In 1873 the English copper import was moderate, and the export considerably greater than in 1872. The following is a comparison of imports and exports of copper at British ports for three years:

	1873. Tons.	1872. Tons.	1871. Tons.
Imports	64,799	76,937	69,308
Exports	49,983	41,154	49,569

Of late years the production of Chili has been on the decrease, that country having yielded only 42,355 tons for export in 1873, against 46,945 in 1872, 41,341 in 1871, 49,308 in 1870, and 55,053 in 1869, showing a decrease of, say, 5000 tons in 1873, as compared with the average of five years. This falling off in the Chilean export results from the advance in coal and wages, and the difficulty of securing labor to work the mines regularly, and maintain an even production of ore. The British product, which 18 or 20 years ago averaged between 22,000 and 24,000 tons, has declined to between 6000 and 7000 tons per annum, and Chili, the Cape and Australia, have had to make up the deficiency. In 1838 England produced 14,000 tons, Continental Europe —principally Russia and Sweden—10,200 tons, and Chili 5650 tons, making a total production of 29,880 tons.

In the United States the production of copper has steadily, and, during the past four years, rapidly increased. Last year the Lake Superior region alone produced 29,000,000 lbs., against 24,250,000 lbs. in 1872, 25,750,000 in 1871, and 24,000,000 in 1870. To oppose the failure of the California mines in 1870, which up to that time had yielded from 1,000,000 to 3,000,000 lbs. per annum, we have Tennesee yielding 1,500,000, lbs. per year during the past four years; Vermont, from 700,000 to 800,000 lbs. per year; North Carolina and other States, 1,500,000 lbs. per year. Utah is also beginning to produce copper, but the smelting is too expensive and the freight to market too high to make the business profitable or encourage the immediate development of the ores of that State. In 1873 our consumption was large and increasing and so continued until the panic, when it almost wholly ceased. It would probably have been 40,000,000 lbs. for the year, had it not been for the panic; as it was the total consumption did not exceed 36,000,000. Even this was a large amount, however, and it is confidently expected that the consumption of the country this year will amount to 34,000,000 or 35,000,000 lbs., unless some fresh financial trouble arises to paralyze our manufacturing industries. Our production, it is estimated, will also exceed that of 1873 by about 5,000,000 lbs. As there were some 2,000,000 lbs. of last year's production left at the lake mines, owing to the early close of navigation last fall, we should probably have suffered from a scarcity of lake ingot had it not been for the check which was placed upon consumption by the panic; but as it is, we shall probably have between 2,000,000 and 3,000,000 lbs. left when the new arrivals reach the market, which cannot be much before the middle of May.

From the foregoing it will be seen that the general position of the copper market is a sound one, and yet to import copper from Chili into England would involve a loss to the importer of £5 per ton. This is a somewhat anomalous condition of affairs; but scarcely more so than exists in this country, since, with a capacity to consume every pound we shall produce, prices here are 30 per cent. lower than in 1873. It is probable, therefore, that we may look for a reaction in the copper market before long, with an advance in prices on both sides of the ocean.

The Centennial.

A meeting of the Executive Committee of the United States Centennial Commission was held last week in Philadelphia, to consider the situation, and after a conference with the Board of Finance, the following resolution was adopted:

Resolved, That the acts of Congress creating the United States Centennial Commission and establishing the international character of the Exhibition, the proclamation of the President of the United States commending the exhibition to foreign nations, the subscriptions made, and installments received on the stock of the Centennial Board of Finance, together with the inauguration and conduct of the work thus far, forbid the abandonment of the international feature of the Centennial celebration of 1876.

This resolution cannot but meet the approval of all friends of the enterprise. If we cannot have an international exhibition and keep faith with the nations which have already received and, in some instances, accepted our invitation to participate as exhibitors, we had better abandon the whole undertaking and let it be understood that we confess our inability to celebrate the centennial anniversary of American independence in a manner worthy of the occasion. Such a confession would be humiliating in the extreme, but better this than that the exposition should be a failure and a disappointment.

At a mass meeting held in Philadelphia on Monday last, the people of the city took this view of the case and pledged themselves to aid the commissioners in making the Centennial a success as an international exposition. The following preamble and resolutions were unanimously adopted:

Whereas, The time has arrived when the work of the construction of suitable buildings for the accommodation of the United States Centennial Exhibition should be commenced to insure their completion by the period appointed for the display of the products and the natural resources of the country, and their development, and of its progress in the arts which benefit mankind, in comparison with older nations; and

Whereas, We have confidence that the Congress of the United States will give the necessary and proper governmental assistance to make the exhibition and ceremonies of the great occasion successful and worthy of the nation; and

Whereas, The honor and credit of the nation is involved in the prompt preparation for this exhibition to which the industrial people of foreign countries, as well as the governments, have already accepted the invitation extended in the proclamation of the President of the United States; and

Whereas, The National Commission and the Centennial Board of Finance have expressed their purpose to proceed with the construction of the buildings on the scale prescribed in the act of Congress of March 3, 1871, providing for an international exhibition of the industries and progress of all nations, and we, citizens of Philadelphia, being ready and desirous now, as we have always been, to give to the National Board our best encouragement and support in their laudable purpose; therefore,

Resolved, That we, citizens of Philadelphia, in mass-meeting assembled, are also willing to assume our full share of the expenses attending the International Exhibition.

Resolved, That we, the citizens of Philadelphia, hereby pledge ourselves to increase the subscriptions to the stock, in addition to the money heretofore subscribed by the city and State, by a sum not less than $1,000,000.

Resolved, That as tax payers and citizens we urgently recommend the Councils of the city to make an appropriation out of the revenues, for the purpose of being used in the erection of exhibition buildings, of a further sum of $1,000,000.

This is practical. From the debates in Congress, and the tone of newspaper discussion thereon, the people of several States have conceived the idea that Pennsylvania is seeking the advantage and profit of an international industrial exhibition, to be paid for by Congress from the national treasury. This is an unfounded and unjust suspicion, considering the fact that the people of Pennsylvania have already subscribed over $3,000,000 toward the sum needed; but it exists, nevertheless, and there is but one way of removing it. If they will take hold of the enterprise with a determination to carry it through, and to vindicate the honor of the nation whether they have any help or not, the people of other States will soon discover that it is to their interest to take part in the work. Let the friends of the enterprise in Philadelphia resolve to do the best they can, without other assistance than has already been promised, and they will get all the help they want when it is discovered that the Centennial is to be a success whether help is received or not. If they make a right beginning, and manifest a determination to carry out the plan which has been approved and adopted, another year will witness a marked change in public sentiment, and in the disposition of Congress. Pennsylvania cannot afford to let the Exposition fail because the people of other States are now indifferent to it.

Instruction for the British Workingmen.

Under the title of "Capital and Labor," the National Federation of Employers in Great Britain have issued a publication advocating "the freedom of labor, the sanctity of contract and of law." It is a newspaper, intended for general circulation, and its purpose is thus described in the leading editorial in the first number: "More "specifically, it is designed to establish "among employers and among non-union-"ist workmen a channel of intercommuni-"cation such as has not hitherto existed, "and by this means to enlist their sympa-"thies and co-operation in what may be "for their mutual advantage; to record and "comment upon all facts bearing upon "national industry; to advocate moderate "and just laws, as opposed to class legisla-"tion of whatever kind; to afford facilities "for the full and impartial consideration "of various practical questions; to pro-"mote the freedom of the working classes, "by watching the plans and movements of "trade unions, and thus to afford the in-"dependent workman an opportunity of "promoting his interests without being "subject to those organizations; and gen-"erally, by the diffusion of sound views "upon labor questions, to contribute to "the elevation of the working classes, and "to the promotion of harmonious relations "between employers and the employed." We regard this as a step in the right direction, provided the new journal is to be an independent and intelligent exponent of sound practical truth, and not merely the organ of employers to engage in wordy warfare with the powerful newspaper organs of the trade unions. Whether the workmen will read it or not, depends very much upon the manner in which it is conducted. If an attempt is made to catch their attention by specious talk about the best interests of labor, they will probably pay little heed to it; if, on the other hand, it presents facts, statistics, and sound, common-sense arguments in a straightforward, practical way, and gives the workingmen information about the state of trade and the real condition of affairs which they cannot find in their own newspapers, they will probably read it attentively and profit by it. Hitherto, all the instruction they have had in the matters which interest them most has come to them from the demagogues and professional "agitators," whose interest it is to excite discontent and foment discord between masters and men. If the masters will take part in the discussion of these topics without going to the other extreme, they will, at least, have the satisfaction of knowing that they are contributing to the education of the working classes, and that with a fuller knowledge and more correct understanding of the true relations between capital and labor, there will be less disposition on the part of the latter to wage profitless and interminable "war" upon the former. That the men need instruction of a very different kind from that which they have received, is very evident.

Great Forgings.

The iron workers of Pittsburgh will have to look to their laurels. Messrs. Lazell, Perkins & Co., of Bridgewater, Massachusetts, are now making three enormous forgings for the Pittsburgh water works—a shaft and two cranks. The shaft is 24 feet 6 inches long, 28 inches diameter, and weighs, finished, 59,280 lbs. The cranks are seven feet between centers. The large hubs are 52 inches diameter and 24 inches thick; the small hubs 28 inches diameter and 20 inches thick. They weigh fifteen tons each. It took eleven and a half days to forge each crank, with a force of twenty-four men. The amount of coal consumed was 185,794 lbs., and the amount of iron 46,500 lbs. The forging was performed under a 12 ton Nasmyth hammer, with 11 feet stroke. These are among the largest pieces of wrought iron ever forged, and are to be finished complete by Messrs. Lazell, Perkins & Co., placed on the cars at Bridgewater and transported without change to Pittsburgh. In August, 1872, the same establishment forged two propeller shafts for the steamers Japan and China, weighing 78,520 lbs. and 67,400 lbs. respectively. We believe that no other establishment in the United States has machinery for forging such immense masses of iron.

The Iron Ores of Virginia.

To the Editor of The Iron Age: In the St. Louis Railway *Register* for Feb. 27th, occurs the following paragraph: "Inquiries from Troy, N. Y., have been received for 5000 tons of Missouri iron ore as samples." The same paper quotes the prices of ores at from $5 to $8 per ton. It would seem from this that it has become necessary for the manufacturers of Troy to look to new fields from which to draw their supplies of iron ore. If so, why go hundreds of miles West, when they have it in their power to get an abundant supply within a short distance of the Atlantic seaboard? It is now known that in the James River Valley, a short distance below Lynchburg, are extensive deposits of rich ores which yield by analysis from 43 per cent. to 67 per cent. of metallic iron. Here are found in close proximity large veins of magnetic oxides, specular, red and brown hematites. These ores have been analyzed by experienced chemists, and some of them have been worked for many years in the furnace. The iron made from them is of the best quality for car wheels, boiler plates, and all work requiring the *best iron*.

I think I am safe in asserting that these ores can be *mined and delivered in Troy at a cost not exceeding the price of the Missouri ores in St. Louis*, while the quality of the Virginia ores shall *in every respect* be fully equal to the best of the Missouri ores. If the manufacturers of Troy and other Eastern iron centers desire to do so, they can have full opportunity to subject these statements to the test of the most thorough examination. Let them come or send any competent experts to examine the ore mines above referred to, and they will, I am sure, be convinced that *this* is the proper source of supply for them. The difference between the cost of these and the Missouri ores would be a very handsome profit to the manufacturer. Surely this is worth examining into.

Very respectfully,
W. B. ROBERTSON,
Commissioner of Immigration.
Lynchburg, Va., March 9, 1874.

Extensive steel works will soon be in operation at Martin's Ferry, Ohio. It is intended to make steel direct from the muck bar, by a process invented by Mr. Smith, the manager of the concern. This article, it is claimed, will be equal in quality to the best tool steel.

The Law of Trade Marks.

In our issue of February 5th we published an interesting and valuable article on the Legal Effect of the Registration of Trade Marks, by Mr. Rowland Cox, of Washington. We now publish an article on the Law of Trade Marks, especially prepared for this journal by a gentleman prominently connected with the New York Bar, and for several years identified with the practice of the higher courts. It presents a synopsis of the law in reference to this important subject as it is now interpreted by the courts, and will be found of interest by all who employ trade marks in their business. It may be accepted as correct and thorough:

The law of trade marks is of comparatively recent origin. Not many years ago the courts were applied to for the first time to give to a tradesman the exclusive use of a certain symbol as a trade mark. One of the most distinguished jurists of England entertained a serious doubt, when the subject was first presented to him, whether law would give a citizen the exclusive right of property in a symbol or device used as a trade mark. It must have been a singular question at first whether a man could invent, coin from his own imagination, a peculiar sign or figure, and claim that he had an exclusive property in it. But since that time the law of trade marks has rapidly matured until its principles are now firmly settled, and what the old jurist questioned is now undoubted law. This branch of the law has arisen with the increase of trade. As competition became closer, trade marks became valuable. What the tradesman had before used as a fantastic designation, a sort of ornament to the article which he manufactured or sold, became now a species of property to be jealously protected. We do not suppose that our fathers were more honest than we, that they abstained from pirating each others' trade marks, but they were not tempted as we are, competition was not so sharp, and the rewards of trade were not so great.

A trade mark may be defined to be any mark, device, words or figures which a dealer may use to indicate that the article to which it is attached is manufactured or sold by him or by his authority, or to indicate his place of business or the origin or ownership of the article. If the party has used the trade mark prior to any one else, he has exclusive right to it, and the courts will enjoin all other parties from using it. In this way the dealer has, in a certain sense, a patent in his article, and one which is not limited to any particular time, and which he may assert if he is a foreigner, for the law will protect a foreigner in the use of his trade mark in the markets of this country. In protecting trade marks the law regards not only the rights of the dealer, but of the public, who may be misled by the imitation. If the buyer wishes to buy an article of white lead, manufactured by the 'Brooklyn White Lead Co.' and in reality buys a different article, being misled by the words "Brooklyn White Lead and Zinc Co." stamped on the kegs of another manufacturer, both he and the maker of the article which he desired to buy are defrauded. Buyers and manufacturers are both entitled to be protected from such an imposition. It is upon this principle that the courts proceed. The Court of Appeals recently expressed it in these words: "The purchaser has the right to have the very thing which he seeks, and the owner has the right that the very thing sought shall be sold at his profit; both have the right that the truthful symbol or device which tells of the genuineness of its origin, shall not be imitated with the intent or effect to deceive." Speaking of the manufacturer, the court say, he "should enjoy an exclusive profit in the result of his powers of invention, ingenuity or skill." (Congress Spring Co. *vs.* High Rock Spring Co., 45 N. Y., 291.) The plaintiff in this case was the owner of Congress Spring, in Saratoga, and sold water from the spring in bottles, with the mark "Congress Spring Water" on each bottle. The defendant was the owner of another spring in Saratoga, and sold water from its spring in bottles marked "High Rock Congress Spring Water." The court decided that the plaintiff should be protected in the exclusive use of his trade mark.

The complainant must himself, however, come before the court with pure hands. The law will not protect a dealer who is defrauding the public. In Smith *vs.* Woodruff, 48 Barbour, 438, the plaintiffs were perfumers, and manufactured a perfume under the name of "Sweet Opoponax of Mexico;" in connection with this name were the words, "The Opoponax is a native flower from Mexico, from which this extract is distilled." The defendant had counterfeited the label, but showed that the plaintiff's claim that his perfume was distilled from the flower mentioned was false. The court held that this was a good defense, on the ground that the law will not aid a party who is imposing upon the public. It has been also decided that the owner of a trade mark must not sell the use of his trade mark to another dealer, who palms off upon the public an inferior article of his own upon the reputation of that trade mark. In the case of Bloss *vs.* Bloomer, 23 Barbour, 604, the plaintiffs, seed dealers, sold empty seed bags to the defendant with their labels on them, the defendant agreeing to fill them with good seed and sell them in a certain district. The court decided this an imposition upon the public. "Money received for such seeds would be obtained by deceit and fraud." The plaintiffs were not permitted to recover upon a contract to be paid a certain sum for the use of their bags.

The cases which most frequently arise are those in which one dealer, for the purpose of enlarging the sale of his inferior article, imitates, partially, the trade mark of another dealer, whose article of the same kind has a larger sale. He does not imitate it exactly, for he knows that the law will not allow him to do that, but he imitates it as closely as he dare. These cases are decided by the closeness of the imitation, the character of the article sold, and of the ordinary buyers of that article. The question is, would the ordinary mass of buyers, paying the attention which buyers usually do in purchasing the article in question, be easily deceived. If men of ordinary understanding would be led to inquire whether they were not being deceived by the article they were purchasing, the court would hardly interfere. The case of Clark *vs.* Clark, 25 Barbour, 76, is of interest here. The parties were well known manufacturers of cotton thread. The labels put upon the ends of the spools by each party were precisely alike in form, color of ink, and general design, and also in words, with the following exceptions. The plaintiff's label contained the words "J. Clarke, Jr., & Co., Mile End, Glasgow. Sole agent, Wm. Whitewright, New York." The defendant's label contained the words, "Clark & Co., Seed Hill, Paisley. Sole agent, George Clark, New York." It was held that the defendant should be restrained from using his label, the difference being too slight to be distinguished by the ordinary run of buyers. The decision uses these words: "An imitation of his" (the dealer's) "mark with partial differences, such as the public would not observe, does him the same harm as an entire counterfeit. If the wholesale buyer, who is most conversant with the marks, is not misled, but the small retailer or the consumer is, the injury is the same in law, and differs only in degree."

A large proportion of trade marks in present use consist of words. They are much more common than devices. There is a peculiar principle applicable to them as trade marks. No dealer has a right to adopt for that purpose a word in common use, which any other dealer could employ with equal truth for the same purpose. For instance, a manufacturer of cotton cloth could not be protected in the exclusive use of the word "cotton" as a trade mark. The true test is this: Any word may be used as a trade mark, when it is appropriated to designate the true origin or ownership of the article to which it is affixed, and when others may not use it with equal truth and have not an equal right to employ it for the same purpose. This principle received the sanction of the Court of Appeals recently in Congress Spring Co. *vs.* High Rock Spring Co. Frequently manufacturers, upon inventing a new article, invent a new word to designate it. To such a word they have an undoubted right. In Bennett *vs.* Phalon, 9 Bosworth, 192, the plaintiff invented a new hair oil and called it "Cocoaine," a new word. The defendant called his oil "Cocoine." The Court said: If plaintiff invents a new word, never before known, and uses it, and publishes it as his trade mark, he has exclusive right to it; but he cannot adopt a word in common use as a trade mark." The Court enjoined the defendant in this case.

Words which others may employ with equal truth, and which cannot therefore be protected as trade marks, are words which indicate some attribute of the article, as quality, texture, composition, utility, destined use, class of consumers, &c.

Some interesting cases have occurred between parties using the same or similar names as trade marks. The proprietors of a hotel in New York City named it the Irving Hotel, or Irving House. The house became widely known under these names, and by diligence and tact the owner had secured a large patronage for it, when the defendant established another hotel in the same city, and named it the Irving Hotel, securing a certain portion of plaintiff's patronage. The Court enjoined the defendant. It will be observed that the name of plaintiff's hotel came under the principle just stated. It did not name any common attribute of public houses, but was a name appropriated by the plaintiff to indicate ownership or origin. One newspaper sometimes adopts a name and style like that of another, with a view of securing a portion of the latter's profits. If the imitation is so close as to deceive the public and induce persons of ordinary understanding to suppose that the spurious copy is the genuine one, the Court will enjoin the offending paper. One periodical has no right to pirate upon the good will of another. (Bell *vs.* Locke, 8 Paige, 75, and Snowden *vs.* Noah, Hopkins Rep., 347.)

Figures have bee protected as trade marks. The number "303" on Joseph Gillott's steel pens was imitated by Esterbrook & Co., manufacturers of steel pens, in New Jersey, the same number being stamped upon their pens. The Court held that this number did not indicate quality or grade merely, but origin or ownership, being selected and used by the plaintiff in connection with his name for that purpose.

In some cases words have been protected as rade marks, not as words, but because there was something so peculiar about them as to make them devices. The word "Ethiopian" was protected as a trade mark, being printed in Egyptian characters, with certain ornamental work about it. The word "Pessendede" was protected, being a Turkish word, meaning "warranted," and printed with certain devices about it. In an important case before the courts, some years ago, the following words were used in the decision: "The moment the straight forward and simple mode of indicating ownership by the owner's name is abandoned, the burden is thrown upon the complaining party of showing that the designation used does not mean something relating to the quality of the article or some other attribute."

A merchant who has a certain class of goods manufactured for his exclusive sale, has a right to adopt a mark for them, and will be protected in the use of it. He has used his capital to buy the right to sell the product of another's skill, and has given his time and energy to extend the sale of it. A commission merchant has no right to sell a spurious article when he knows it to be such, and may be restrained from selling it.

These are in brief the leading principles of the law of trade marks. They are now firmly fixed in the law of the land, and may be considered safe guides in the invention and use of this peculiar characteristic of modern trade.

THE "CITY OF PEKING."

Launch of the Largest Iron Steamship ever Built in the United States.—Description of the Vessel and Machinery.

Yesterday witnessed a triumph of American shipbuilding enterprise in the launch of the "City of Peking," from the yard of Messrs. John Roach & Son, at Chester, Pa. This latest addition to the Pacific Mail fleet of thirty-five steamers had not, up to the date of launching, been measured for register, but her gross burthen will fall very little short of six thousand (6000) tons. Her extreme length of hull is 423 feet, by 47 feet 3 inches breadth of beam, and she is 36 feet deep between the top of the keel and the spar deck. She has four decks, and six water tight compartments. She has accommodations for 150 cabin passengers, and 1500 steerage passengers, and her coal bunkers will carry 1500 tons. The bulkheads are fitted between double frames, so as to insure the greatest tightness and resistive power in the event of it ever becoming necessary to depend on them for safety. All the deck beams are placed on every alternate frame, with "knee" plates forged on them, and are riveted to the frames and stringers. Calculation has been made and jointings and sockets prepared for beams to support the engines and boilers in too many ways to admit of detailed description. The "shell plating" of the vessel varies in thickness. No plate is less than 12 feet long, and each plate tapers to suit the ship's sheer. Every shell plate has been tested, before being put into the ship, to several times the strain, in both simple and compound relations, it can ever be called upon to bear in actual use. All shell plates are flush jointed on the vertical section, and lap jointed on the longitudinal section; they are all riveted according to the rules of the Bureau Veritas.

All the ship's skylights are arranged to combine the maximum of utility, strength and water-tightness. The rudder is of the best hammered scrap iron, and every means that intelligence has devised and experience confirmed as useful has been employed to render this important part of the vessel absolutely secure.

The "City of Peking" is furnished with the most approved steam steering apparatus, as well as two other hand wheel steering apparatuses, one forward and the other aft. The steam apparatus is furnished with a friction brake to hold or stop the rudder at any point, and with a pointer to indicate exactly at what degree the rudder is at any moment. The whole of the bottom of the ship is covered with White's waterproof Portland cement to the thickness of one inch, excepting under the engine and boiler space, where the cement fills up all spaces solid to the limber holes. The four decks are as strong and watertight as iron plating and fastenings and hard wood and pitch pine and cement can make them.

For the comfort of passengers ventilating apparatus has been provided in every part of the ship. The fittings and upholstery are comfortable and elegant in every respect. The upholstery is principally of crimson Utrecht velvet, and the cabin furniture includes everything of utility and convenience that is common in first-class private residences. Particular attention has been devoted to the provision of a smoking room as spacious and splendidly appointed as the most exacting taste could require. The hospital is built and furnished with everything necessary to the perfect working of that department. The cook's room is furnished with everything that can render complete a marine kitchen. The dining saloon is 34x47 feet, and is finished in maple and ebony, with an elegant cornice around the ceiling, and with appropriate paintings in the panels, and with plate mirrors and piano. Nothing has been omitted that could render this saloon, in equipment and decorations, the model of its class. The ladies cabin is abaft of all the other cabins. A low and wide sofa runs around the stern, with hard wood arm pieces placed about twenty-four inches apart, to form seats. Adjoining the cabin is a commodious ladies' bath room, with shower bath, and otherwise fitted with all the latest improvements.

The mail room and the bullion room are each built entirely of iron, with iron decks and ceilings, and are fitted with Chubb's chilled iron doors and locks.

The cabin state rooms have intermediate doors whereby they may be converted into double state rooms. The doors are furnished with ground plate glass, and the bedding and all other accommodations are in a style that could not be surpassed. All berths are 6 feet 6 inches long by 28 inches wide.

The night lighting is from electro-plated moderator lamps of the most approved construction, and is ample for all purposes. To prevent rust and to secure permanent soundness, every piece of iron received three coats of red lead paint in addition to the ornamental painting. The frames and plates were both painted before the ship was put together, and previous to launching the hull was covered with several coats of anti-fouling composition.

The ship is furnished with ten boats, the largest four of which are 26 feet long by 7 feet 6 inches wide, and 3 feet 3 inches deep, and the smallest 22 feet long by 5 feet 3 inches wide and 2 feet 2 inches deep. They are fitted with lowering apparatus, and are otherwise perfect, according to the most exacting conditions of the official inspectors. All the lower masts and topmasts are of iron, and in one piece, and the sails are made of the extra long flax canvas of the Gomock Ropework Company. The ship is furnished with a full set of incombustible awnings which cover it from stem to stern. The distilling apparatus provides 4000 gallons of fresh water per day for passenger consumption.

The total weight of iron used in constructing this steamship was 5,400,000 lbs.

The foregoing are the principle facts of general interest concerning the hull of the "City of Peking." From them it will be seen that, with the exception of the "Great Eastern," whose gross measurement is 22,500 tons, she is the largest mercantile steamship ever built in any country, and the largest trading steamer that ever carried the American flag.

THE MACHINERY.

The engines of the "City of Peking" are correlative with the magnitude of the vessel. They represent 5000 horse-power, and constitute, with one exception, the largest piece of mercantile marine machinery ever constructed. They consist of two pairs of compound engines. The stroke is 54 inches. There are two low-pressure cylinders of 88 inches each, and two high-pressure of 51 inches each—thus giving an aggregate cylinder-diameter of 278 inches. Either engine may be detached from the other, and in case of breakage of one of them at sea, the sound one may be worked while the other is in process of repair, and will propel the vessel at two-thirds of its regular speed. The pumps for circulating the water through the surface condensers are independent of the main engines, which is a decided improvement.

This colossal machinery is to be furnished with steam from ten cylindrical boilers 13 feet in diameter by 10 feet 6 inches long, the shell of each boiler being 13-16 of an inch thick, and double riveted. Each boiler has three cylindrical furnaces, with 204 tubes 3¼ inches outside diameter, by 7 feet 6 inches long. The total grate surface in these ten boilers is 520 square feet, and the total heating surface is 17,000 square feet. This is the largest heating surface ever provided for the engine of any mercantile compound marine engines, and will evolve valuable economic results in permitting slow combustion of fuel while the machinery is at full working power, and thus ensuring a development not very often attained—namely, the complete consumption of all the coal put into the furnaces.

The length of the crank shaft is 39 feet, and that of the "line" and propeller shafts is 128 feet—total, 167 feet. The diameters of these shafts in the bearings is as follows: Crank shaft, 18 inches; "line" shaft, 17 inches; propeller shaft, 19 inches. The immense "journal" diameter of the propeller shaft is used to minify the possibilities of breakage at sea. This shaft derives additional security from the fact that it has a bearing in the rudder post. It is also encased in composite metal where it rests on the inboard and outboard bearings (three in number), and revolves on staves of *lignum vitæ*, so set that the friction comes on the end of the grain, and that the water may circulate between the staves and prevent hot bearings. It is calculated that this arrangement of the propeller shafting is so perfect that no renewal of any part of it will be required on account of ordinary wear and tear, before the expiration of eight years. In view of the fact that the engine will average 65 revolutions per minute, the mechanism and setting of the propeller and its shafting, which insures eight years of continuous wear without repair, must be regarded as a triumph of skill in this branch of engineering.

The ten boilers are supplied with fresh water by means of two surface condensers of about 10,000 square feet. These condensers are so perfect as to return to the boilers all except a very small percentage of the water necessary for generating steam.

An improvement has been effected whereby the verdigris from the copper tubes of the condenser is neutralized by the introduction of salsoda, which combines with the verdigris, tallow and oil from the cylinders and condensers, and is deposited at the bottoms of the boilers. This combination obviates the corrosion—or "pitting"—of the boiler tubes from verdigris, and thus saves a very heavy expense. About three-quarters of a pound of salsoda is used for every ton of coal burnt.

The steam is drawn from the boiler through a perforated dry pipe, and passes into a cylindrical superheater 15 feet high by 11 feet in diameter, with four internal flues of a diameter of 3 feet 2 inches each. Heat from the boiler fires circulates through these flues on the inside and dries the steam which surrounds them on the outside. The steam passes from this superheater into the high pressure cylinders, where it is expanded from 60 lbs. per square inch down to 10 lbs. It is then exhausted into a receiver between the two engines, from which it passes into the low pressure cylinders, where it is further expanded down to 10 lbs. below atmospheric pressure. The high expansion thus denoted is a cause of great economy in fuel.

The "Colon," "Colima," "Acapulco" and "Granada" each burns about 25 tons of coal per 24 hours when running on the schedule time. The "City of Panama" and "City of Guatemala" burn fourteen tons under the same conditions. The "City of Peking" will, by close estimate, burn somewhat less than 60 tons per day while making schedule time. If it were not for appearing to make invidious distinctions, vessels of smaller size and less power than the "City of Peking" might be named which, though considered as economic in all other respects as the "crack" ships of certain foreign fleets, consume not less than between 65 and 80 tons per day under the most favorable conditions.

The engines herein described are warranted to drive the steamer 15½ knots—more than 19⅛ statute miles—per hour in average weather. They will develop an actual working power of 12 per cent. in excess of that of the engines built by Maudslay, Son & Field, of London, for the "Ville du Havre," and 18 per cent. more than the working power of any other compound engine now afloat in a merchant ship.

The propeller of the "City of Peking" is a Hirsch screw, 20 feet 3 inches in diameter, with 4 blades, and a mean pitch of 30 feet. In case of leak the ship's pumps are capable of throwing 10,000 gallons (250 barrels) of water per minute. There are four donkey engines with separate boilers which may be worked in connection with or detached from the main boilers. There are three freight hatchways on deck, each furnished with a steam winch for hoisting and lowering freight. The forward winch also works the anchor, and the sails are hoisted, set, and furled by means of these winches, thus reducing the labor of the crew to a minimum.

In regard to security from fire, it must suffice to state that every known appliance of pipe, hose and pumps have been furnished throughout the vessel to extinguish fire.

The "City of Peking" will be immediately brought from Chester to the Morgan Iron Works, foot of 9th street, East River (New York), where she will be fitted with her machinery and made ready for sea as soon as possible.

Nothing has been left undone to render the "City of Peking," in every possible respect, an absolutely perfect vessel. She enters the water as the Pride of the American Navy, and, without detracting from the worth of any foreign vessel, has no equal now afloat available for commercial purposes. She is one-fourth larger than the "Celtic," the largest White Star ship. Three years ago the almost universal belief was that no such vessel could be built except on the Clyde.

THE LAUNCH.

Early in the day the multitude began to gather, and soon every available point of observation along the water front was crowded, and hundreds found accommodation on steamers and in small boats. The special trains from New York, Washington and Philadelphia brought a large company of invited guests, some of whom were admitted to the deck of the "City of Peking," while others took positions upon the companion ship lying alongside, and on the monitor "Wyandotte," moored at the pier. At ten minutes past one the workmen began knocking away the timbers which supported the ship on her ways, and before any one was prepared, the great hull began to move—slowly at first, but with gradually increasing speed. There was not a jar nor a "hitch" perceptible to any one on board, and the vessel took the water as easily and gracefully as a swan, amid the shouts and cheers of the assembled multitude, the roar of artillery, the shrill shrieks of steam whistles, and the music of the bands. The mechanical arrangements were perfect, and although the vessel slipped away before the time, there was no accident of any kind to record. The vessel ran far out into the river, and was towed back by the steam tug in waiting. The foreman in charge of the work of preparing for the launch certainly deserves great credit for the perfect manner in which all the arrangements were conducted, and it was accorded him by acclamation. The sight was both impressive and exciting, and will long be remembered by those who had the good fortune to witness it. After the launch the guests of the Pacific Mail Steamship Company partook of a bountiful lunch served in the new mold loft, and returned in the special trains which brought them.

The "City of Taikio," a companion ship to the "City of Peking," is in process of construction by the same builders, and will be put afloat within a short time.

The Brand of Cain.—The *London Times* says: The steel melters of Sheffield have, at a general meeting, adopted a resolution which is, perhaps, unique, even in the annals of trade unionism. Two years ago the men succeeded in getting Saturday's work reduced from three to two "heats." As the melting pots can be used three times, the throwing them away when only twice used entailed a considerable loss upon the masters. Messrs. Jessop recently offered their men a premium to work a third heat on Saturday, and they agreed to do so. The officials of the union, who had not been consulted, became aware of what had been done, and a general meeting was held on Thursday night to consider the conduct of Messrs. Jessop's men. The meeting, after protesting against the introduction of the three heat system on Saturdays, and pledging itself to use every means to stop it, passed the following motion unanimously: "That this meeting hears with disgust the names of men who are not only sacrificing their own principles, but also those of the whole of the men in the trade, and hereby inform them that in the eyes of all those men they will carry with them the brand of Cain, and that from henceforth if they continue the practice they will be considered unworthy of sympathy and regard."

A correspondent of the Norristown *Herald* writes from Camden describing a narrow gauge railway recently put into operation between that city and Gloucester. He says: The length of the road is three miles, and the gauge 36 inches. Heretofore, the people of Gloucester had an uncertain ferriage to Philadelphia, and bad roads to Camden, and to obviate these difficulties a company was organized a few months since, under the title of the Camden, Gloucester & Mount Ephraim Railroad. The survey was made and the work of construction immediately begun, and two weeks ago the first train, consisting of a model engine of twelve tons, made by the Baldwin Co., of Philadelphia, and three beautiful and comfortable passenger cars, built by J. C. Brill & Co., of Philadelphia, commenced making five round trips between Camden and Gloucester, on a fare of ten cents each way, including ferriage to Philadelphia *via* Kaighn's Point ferry. The road became so popular that in one week arrangements were made to increase the number of trains from five to nine each way, in order to meet the increasing demands of passenger and freight transportation, and the enterprise is considered an assured success.

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, March 16, 1874.

When two weeks since I protested against the arguments of Senator Sumner on the Centennial question, no one supposed that by this date he would have been gathered to his Fathers, and his remains be receiving the last offices of respect. A great, but never a popular, man, Mr. Sumner's memory would have been more revered and his reputation more lasting had he died at the close of the war than now. His death, however much it may be regretted, will probably make such changes in the constitution of Congressional Committees as to materially alter the present condition of affairs, and give an opportunity for favorable action on the important subject before both houses. We are now fast nearing the period when Congress must take some action on the currency question, or we will have a new panic. The possible election of Mr. Dawes to the vacant Senatorship from Massachusetts, will probably place Judge Kelley at the head of the Committee of Ways and Means, which cannot fail to increase his influence and the strength of the measures he supports. These measures are evidently gaining in favor, and the outside pressure is becoming so considerable that Congress will soon be compelled to give heed to it. From this view of the case it is, at least, probable that we may soon expect favorable action on the currency question, and with that the long delayed revival of trade.

The sensation of the week has been the arrival of the *Pennsylvania*, with the loss of her captain and both first and second mates and two seamen. The particulars have been sufficiently published for general information, but it was extremely fortunate that the ship had, as passenger, a sailor competent to bring her into port, since the incompetency of the third officer would have resulted in the total loss of ship, crew and cargo. A visit to the steamer at Cramp's yard shows the very heavy weather she has undergone; but the fact that she is there at all, and also landed her cargo without the slightest damage, speaks well for American iron ship building. The strength of the seas which boarded her is apparent from the manner in which the iron work of the bridge is bent and twisted, while the remains of the house torn away show that neither wood nor iron could withstand the impact of such seas. In many places her deck rail stanchions of iron which sustained the railing, which, in her case, replaced the ordinary bulwarks, are snapped short off, and the whole iron work of the main deck is more or less strained and started. She is to be repaired at once, with some alterations, and the Cramps promise to have her in the line again by April 1st. The company recognized the services of Captain Brady, who brought the ship into port, by complimentary resolutions and a thousand dollar check, which is pretty cheap salvage for a ship of this value. While writing of this ship, I include the iron ship notes of the day in this vicinity. The Red Star Line to Antwerp, of Messrs. Peter Wright & Sons—the Liverpool service of this line having been consolidated with the American line—is to be increased to eight steamships, by the construction of three new steamers, of which the *Cybell*—the first—is on her way now hither, and the second—the *Switzerland*—will soon follow. This line promises to be profitable, but in neither this case nor that of the American line, is it yet time to compare them with British lines in point of profitable competition for the North Atlantic trade. The steamers carry full cargoes, and are doing well, but are not run as cheaply as foreign ships.

At Cramp's yard the five remaining colliers of the Reading Railroad Company are progressing rapidly. The order was for six, of which one—the *Harrisburg*—was launched in January last, the *Lancaster* is to be launched this week, and the others will be ready within three months. These are each 1500 ton ships, and will be of great service to the company.

At Roach's yard, at Chester, on the 18th inst., and before this is published, will be launched the Pacific Mail Company's new ship, the *City of Peking*. With the exception of the *Great Eastern*, this is the largest ship in the world, being of 5000 tons burden, and constructed entirely of American material. Another ship of the same size for the same line will be launched within thirty days. So iron ship building is steadily progressing on the Delaware, while on the Lakes it is also growing apace, the Union Iron Company, of Buffalo, having rolled the plates for ten iron propellers, which have been successfully launched from their boat yards.

The condensation of the Annual Report of the Pennsylvania Railroad, published in your last, gives the main facts of the report, but one or two curious points remain to be noticed. Of these, is the fact that while following the policy of other companies, the Pennsylvania has secured control of 28,050 acres of coal land, costing $3,857,574, and valued at $10,050,000. The coal carrying trade of the road is increasing, especially in bituminous coals. The latter are in strong demand for gas, steam and iron making purposes, and especially for West Indian shipment since the advance in English coal. The company transported in 1873 nearly three and a half million tons of bituminous and also three million tons of anthracite on the main line. The report has this significant paragraph for the Grangers, in speaking of the coal question: "The carriage of this product is much larger, and the profit derived from it quite as great per ton per mile, as from the agricultural products of the West."

The favorable showing made by the report has healed the breaches in feeling among the stockholders, and it is likely that the majority of the former managers may be re-elected, although there are many street rumors of radical changes to be made. The opposition to the Centennial in Congress has by no means disheartened the managers, who intend to persist in making it, as first proposed, an International Exposition, as it should be. The executive committee met during the week, and a general meeting of citizens is to be held within a day or two, at which vigorous action is to be taken. It is probable that the greater portion of the money requisite will be raised here in Pennsylvania, and the demands upon the general government be slight, while the international feature of the Exposition will be retained. Whether national or international, the Centennial must be held, and while it will be shorn of a great part of its value to the country if it does not include foreign exhibitors, it will still give us an opportunity to show our material progress.

In business matters the least said the better. Trade is frightfully dull, and the complaints are universal on all sides and all branches. Unless something is done in Congress soon, and that something be very definite in quality, we may look for a renewal of failures similar to those of last fall.

Special Notices.

Special Notices.

Special Notices.

For Sale.

For Sale, &c.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, March 18, 1874.

We have nothing but prolonged dullness to report in connection with "the street." The currency question has not yet reached its solution, and, indeed, has made but little progress in Congress, as the deliberations of that body have been interrupted by the death of Senator Sumner. Foreign advices have been unimportant as bearing upon our market. The demand for money remains tight, and while the supply is not over abundant for this period of the year, the unusually light call has depressed the rates, and call loans are easily effected at 3 @ 4 per cent., while prime paper sells at 5 @ 7 per cent.

The gold market has been dull, but very strong, and the premium has advanced, after some fluctuations, ⅛c. @ ¼c. since our last report. The highest and lowest prices are shown by the following table:

	Highest.	Lowest.
Thursday	112⅛	111⅞
Friday	112⅛	111⅝
Saturday	112	111⅜
Monday	112¼	111⅞
Tuesday	112⅛	111⅞
Wednesday	112⅛	111⅞

Foreign exchange has been very firm, and is quoted at 4·84⅛ @ 4·85 for 60 day bills and 4·87½ @ 4·88½ for demand drafts.

The stock market has been affected chiefly by the movements of Mr. Jay Gould, and for the most part has been feverish. His election to the directorship of the Union Pacific Railroad Company depressed the stock of that road at first, but the price has since advanced. Other stocks have been rather quiet, but toward the close of the week the entire list has been stronger. The principal dealings were in Telegraph, Lake Shore, Union Pacific, Northwestern, Wabash, and New York Central and Hudson.

Governments have been very firm in sympathy with gold, though the transactions have not been heavy. Late securities have been quiet though steady.

The bank statement for the week shows unimportant changes. The banks have now in lawful money above 25 per cent. of their total liabilities, $22,077,050, which is $124,625 more than so held last week. In brief the statement may be said to reflect the general dullness which now pervades every department of business. The following is a comparison of the averages of the past two weeks:

	March 7.	March 14.	Differences.
Loans	$286,787,200	$285,717,100	Dec. $1,070,100
Specie	28,074,100	27,914,300	Dec. 159,800
Leg. Ten.	61,655,100	61,652,600	Dec. 2,500
Deposits	244,199,300	243,238,500	Dec. 960,800
Circ'lation	26,907,800	26,720,900	Dec. 186,900

The movements in foreign trade for the week have been as follows:

IMPORTS.

	1872.	1873.	1874.
Total for week	$5,288,441	$5,974,593	$9,909,096
Prev. reported	76,613,525	82,475,621	70,686,452
Since Jan. 1	$81,851,966	$88,450,214	$80,595,548

Included in the imports of general merchandise for the week are:

	Quant.	Value.
Anvils	210	$2,178
Brass goods	11	1,280
Chains and anchors	156	7,345
Copper	...	4,648
Cutlery	117	41,349
Guns	69	12,325
Hardware	99	12,288
Iron pig, tons	1,044	31,063
R. R. bars	2,845	49,009
Iron tubes	1,660	2,427
Iron, other, tons	25	3,242
Lead, pigs	160	1,158
Metal goods	103	12,913
Needles	9	2,707
Old metal	...	174
Plated ware	1	207
Per caps	3	644
Saddlery	4	1,081
Steel	2,824	32,802
Tin, boxes	20,576	180,902
Tin, 3,643 slabs	223,496	58,472
Wire	16	3,115

EXPORTS EXCLUSIVE OF SPECIE.

	1872.	1873.	1874.
For the week	$3,845,903	$4,068,273	$4,751,438
Prev. reported	41,971,329	49,698,289	52,750,510
Since Jan 1	$45,817,232	$53,766,562	$57,501,948

EXPORTS OF SPECIE.

Total for the week	$435,452
Previously reported	5,566,279
Total since January 1, 1874	$6,001,731

Government bonds closed as follows:

	Bid.	Asked
U. S. Currency 6s	116½	116¾
U. S. 6s 1881, reg.	119¾	119¾
U. S. 6s, 1881, cou.	120	120¼
U. S. 1862, 5-20 reg.	117	117¼
U. S. 5-20 1862, cou.	117½	117¾
U. S. 5-20 1864, reg.	119	—
U. S. 5-20 1864, cou.	119¼	119½
U. S. 5-20 1865, reg.	119½	—
U. S. 5-20 1865, cou.	120½	120⅝
U. S. 5-20 1865, reg. new	118¼	119
U. S. 5-20 1865, cou.	118¾	118
U. S. 5-20 1867, reg.	119	119¼
U. S. 5-20 1867, cou.	119¾	119⅞
U. S. 5-20 1868, reg.	119½	119⅝
U. S. 5-20 1868, cou.	119¾	119⅞
U. S. 10-40 reg.	114	114¼
U. S. 10-40 cou.	114	114¼
U. S. 5s 1881 reg.	114½	114¾
U. S. 5s, 1881 cou.	114½	114¾

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	101½	100¾
Lake Shore	79	78½
Rock Island	106	105¾
Del. Lack. and Western	109¾	109
Wabash	48	47
Harlem	132½	132½
Western Union Telegraph	78	78¾
Northwestern	55	54
Milwaukee & St. Paul	43½	43½
Pacific Mail	44½	44½
Erie	43¾	43¾
Ohio & Mississippi	31	30¾
Union Pacific	34¾	34¾
C. C. & Ind. Central	31¾	31
Atlantic & Pacific Preferred	17	16¾

GENERAL HARDWARE.

The general aspect of the Hardware trade differs but little from the reports of the past few weeks. Most of the houses report an active business, while a few complain of dullness. The orders by letter have been very satisfactory, and a number of buyers have visited the city since our last writing. It is worthy of remark that while a good many complaints have been made regarding the volume of business in comparison with former years, that several manufacturers of leading goods are already behind their orders. Among others, we notice Henry Disston & Sons, who commenced the season with a considerable stock of goods. For Edge Tools generally, of well known brands, the demand has been in excess of the supply.

It has been notorious that the manufacturers of Chisels and Drawing Knives have, for a long time, been selling these goods at prices which have been too low for profit. An attempt is now making to secure the co-operation of the leading makers, with a view to adjust prices on a paying basis. Negotiations are pending between the principal Wringer manufacturers, which, if successful, may result in an advance on present combination prices. On the other hand, their failure may be the occasion of a very material decline.

There is a good deal of irregularity in the prices of Cast Butts. William A. Dodge reports an advance in the price of Blake's Loose Pin Cast Butts, for which he is agent, to discount 33⅓ and 10 per cent. Graham & Haines, agents for the American Butt Co., quote the same price. Horace Durrie & Co., agents for the Ohio Butt Co., have made no change in their prices for these goods, while Sargent & Co. continue to quote them at discount 40 and 10 per cent.

Graham & Haines, agents for J. Mallinson & Co., manufacturers of Cast Steel Shears and Scissors, offer these goods, in lots of fifty dozen, at discount 70 and 10 per cent. for the next thirty days.

The Brass Manufacturers' Association held a meeting in this city to-day, but no change was made in prices.

The Norwalk Lock Company have prepared a new catalogue of their Locks and Door Trimmings, making a handsome book of 279 pages, of the same style as their previous catalogue, but considerably enlarged by the addition of new goods. The catalogue contains no prices, which are all given on a separate condensed list, in a form very convenient for reference.

There is no change to report in the condition of the market for Foreign Hardware. The bulk of the business is, as previously reported, transacted by letter, and is confined to filling assorted orders for the present requirements of the trade. Prices are well maintained, although the weakness already noticed in the matter of Coil Chain and Traces still continues. Charles Peace, agent for Joseph Rodgers & Sons, reports a fair demand for the goods of that popular house, and quotes Rodgers' Scissors, Razors and Spring Cutlery at 10 per cent. advance on the sterling list; Ivory Table Cutlery, Carvers and Fancy Goods at 20 per cent. advance, and Common Table Cutlery at 15 per cent. advance. Scissors and Table Cutlery from stock at $7·50 to £, and Spring Knives, $8·50 to £, subject to the advance mentioned above.

Trade in Nails is fair for the season, and prices remain as quoted last week, viz., $4 net for 10d., in large or small lots. We have heard of a lot of 500 kegs being offered at $3·90, net, but the market is nevertheless strong at $4.

Hogan, Clarke & Sleeper quote Washoe Tool Co.'s Drifting and Pole Picks at discount 20 per cent., instead of 10 per cent., as before quoted, and Pick Eyes at discount 15 per cent., formerly 20 per cent. They report an active demand for these goods. The new catalogue of Hogan, Clarke & Sleeper has just been received from the printer's hands. From a hasty glance over its pages we are only able to say that the typography is excellent; the illustrations full, and the book, which is a comprehensive one of nearly eight hundred pages, bears evidence of care and good judgment in its compilation. It contains, we were informed, some matters of special interest to the trade, published for the first time. We hope to review it more fully in a future issue.

The House Furnishing trade does not come up to the expectations of manufacturers. Prices, as a rule, are firm, and but little disposition is manifested to shade the minimum rates with a view of forcing sales. There are no changes of importance to note in the matter of prices.

Joseph Scheider & Co., No. 58 Beekman street, have established the following prices for Water Coolers for the coming season:

2 Gallons, Brass Lever Faucet	each $2·00
3 " " " "	" 2·50
4 " " " "	" 3·00
6 " " " "	" 3·75
10 " " " "	" 6·50

The discount from the above is 10 per cent. by the case. For large lots an extra discount is allowed. These Water Coolers are lined with Galvanized Iron, and are handsomely finished in imitation woods and fancy colors. The Patent Self-Righting Cuspadores manufactured by this house have become a staple article in the House Furnishing trade, and are fast taking the place of Spittoons wherever they have been introduced, both for public and private use. They are made in over forty different patterns, many of which are really elegant, and will compare favorably with the finest japannery of either foreign or domestic manufacture. As its name implies, it is almost impossible to upset it; no matter how much it is inclined, the weight of the bottom brings it back to its upright position. The following is their list, which is subject to a discount of 10 per cent. in cases of one dozen each:

PATENT SELF-RIGHTING CUSPADORES.

Loaded Bottoms.

No. 300, Brown, Gold Band	per doz.
No. 301, Dark Blue, "	"
No. 302, Light " "	"
No. 303, Green, "	"
No. 304, Light Red, "	"
No. 305, Dark " "	"

} $10·50

Cast Iron Bottoms.

Class A.

No. 1, Lava, with Green Band	per doz.
No. 3, Blue, " White "	"
No. 6, Ch'colate, with Orange Band,	"
No. 7, Lilac, " Maroon "	"
No. 9, Chocolate, " White "	"
No. 12, Green, " Black "	"
No. 13, " " White "	"

} $15·00

Class B.

No. 2, Red, with Black Band	per doz.
No. 3, Buff, " Red "	"
No. 5, Green " Gold Scroll	"
No. 7, Lava " " Vine & Berry	"
No. 8, Blue " " Scroll	"
No. 10, Maroon, with Gold Scroll	"
No. 12, Lilac, with Red Band & Gold Flowers	"

} $18·00

Class C.

No. 2, White, with Blue & Gold Band	per doz.
No. 3, " " Vermillion "	"
No. 4, Chocolate with "	"
No. 8, Vermillion, with "	"
No. 14, Blue, with Gold Scroll,	"
No. 15, Green, " Illuminated Gold Band,	"
No. 18, Vermillion, with " "	"
No. 19, White, with Green and "	"

} $21·00

Class D.

No. 15, Lilac, with Gold & Illuminated		per doz.
No. 16, Black "	"	"
No. 17, Blue, "	Flowers,	"
No. 18, Buff, "	White,	"
No. 19, Green, "	Flowers,	"
No. 21, Maroon, "	Illuminated,	"
No. 23, Chocolate, "	"	"
No. 25, Blue, "	Flowers,	"
No. 26, Buff, "	Green,	"
No. 27, Green, "	Flowers,	"
No. 28, Black, "	Ornamented,	"

} $24·00

Nickel Plated on Brass. Per doz.

No. 1, (Large) Iron Bottoms	48·00
No. 2, (Small) " "	42·00

The line of Toilet Ware manufactured by this house is large and complete, at prices ranging from $2·75 to $4 per set.

The Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y., have issued, under date of February, 1874, an illustrated catalogue of the goods of their manufacture. They have added to their line of Cross Cut Saws a new one patented on the 17th ultimo, which they have called "Star;" price 95 cents per foot, less discount 30 per cent. The following discount sheet, dated 6th instant, applies to their revised catalogue.

Shingle Saws	25 per cent.
Mulay Saws	
Mill Saws	
Gang Saws	
Pit Saws	
Circular Saws up to and including 46 Inches	
Circular Saws over 46 inches	30 per cent.
Cross Cut Saws (all kinds)	
Patent Cross Cut Saw Handle	
Upset Punches	
Hand, Panel and Rip Saws	15 per cent.
Pruning, Back and Half-Back Saws	
Butcher-Bow and Compass Saws	
Kitchen Saws	
Wire Gauges	
Saw Mandrels	
One-Man Cross-Cut Saws	
Roberts' Patent Wood Saws	
Wood Saws, framed, with Common, Champion, or Conqueror Webs	
Billet Webs, with Common, Champion, Boston, Conqueror, or Tuttle Hook Tooth	
Butcher-Bow Webs	
Mill Webs	
Cooper Webs	
Felloe "	
Turning "	
Hack Saws	
Key Hole Blades	
Cabinet Scrapers	
Hand-Saw Handles	
Repairing Saws	
Files	50 per cent.

The above rate of discount may be varied without further notice, as the cost of producing our goods is increased or diminished.

Goods will be invoiced at the rate current when shipped, without further notice.

They propose to keep with their New York agents, Horace Durrie & Co., a full stock of all the goods of their manufacture.

We invite attention to the advertisement on 12th page of J. Palmer & Co., Concord, N. H., Manufacturers of Carriage Springs. Concord has long enjoyed a national reputation for the excellence of its Wagons, and Concord Carriage Springs enjoy an enviable reputation in the trade for durability, elasticity, style and finish. The Concord Spring Works, of which the above mentioned firm are proprietors, manufacture and keep in stock a full line of all regular sizes of Side and Elliptic Springs, and make to order special sizes. Mr. Palmer has had an experience of over twenty-five years, and, beside being a practical Spring maker, is the inventor of several valuable improvements in Spring machinery. All goods turned out from this establishment have his personal supervision, are made of the best quality of English Steel, and fully warranted.

Pugsley & Chapman, No. 6 Gold street, quote American Lock Company's Locks at discount 33⅓ per cent. They offer their Wheelbarrows at the following discounts:

Canal Wheelbarrows	dis. 10&5 %
Coal, Garden and Stone	" 20 %

The Milwaukee *Journal of Commerce*, of 11th instant, devotes the greater part of its first page to a picture and description of the new store of John Nazro & Co., of that city, which was thrown open to visitors on the 6th instant. Some idea of its enormous proportions may be had from the following description, which we clip from the *Journal:* The store is situated at the corner of South Water and Reed streets, in the Fifth ward. It is 101 feet on S. Water and 140 on Reed street. The building is five stories high above the basement, with a hollow sidewalk on each street, 15 feet wide and 271 feet long. The hights of the different stories are as follows:

Basement.	9 feet in the clear.
First story,	18 " "
Second "	14 " "
Third "	13 " "
Fourth "	17 " "

Total hight from top of sidewalk to top of cornice is 69 feet. To the top of pediment 79 feet. The basement is well lighted on the alley and both fronts, including glass in sidewalk. The basement is divided by two walls lengthwise, which support the first story joists, including 55 fluted iron columns with Corinthian caps. The upper stories have each also 55 columns. The South Water street front is supported on 13 heavy iron columns. This front of 101 feet on the first story between columns is filled with best French plate glass, giving this a fine, light and pleasant appearance.

Under date of March 20, George Parr, Buffalo, issues the following discount sheet:

Page.	Discount per cent.
1, George Parr's Concave Razor Blade Drawing Knives	50&10
1, George Parr's Oval Blade Drawing Knives	60&10
2, " " Wagon Makers' Drawing Knives	60&10
2, George Parr's Razor Blade, Carriage Makers' Drawing Knives	50&10
2, George Parr's Razor Blade Wagon Makers' Drawing Knives	50&10
3, George Parr's Shingle Knives	60&5
3, Adjustable Handle Drawing Knives	10
3, George Parr's Farmers' Drawing Knives	60&10
4, " Socket Firmer Chisels	60&10
4, " " Framing "	60&10
4, " Extra Solid C. S. Framing Chisels	50
4, " Oval Back "	60&5
4, " Farmers' Socket "	60&5
4, " Corner Chisels	60&10
5, " Carpenter's Slicks	60&10
5, " Socket Framing Millwright's Chisels	60&5
5, George Parr's Socket Firmer Gouges	40
5, " " Coach Makers' Socket Chisels	20&5
6, J. Bentley & Co.'s Socket Firmer Chisels	60, 10&10
6, George Parr's Tang Firmer Chisels and Gouges	40
7, " Socket Firmer Millwrights' Chisels and Gouges	20&5
7, George Parr's Tang Millwright Chisels and Gouges	40
8, George Parr's Socket Firmer Paring Chisels and Gouges	20&5
8, George Parr's Tang Firmer Paring Chisels and Gouges	40
9, George Parr's Coach Makers' Tang Chisels	40
9, " " Tang Turning Chisels and Gouges	40
9, Best C. S. London Pattern Screw Drivers	10
9, Cast Steel " "	20
10, Socket Scratch Awls, No. 450	10
10, Scratch Awls, Beach and Fancy Handles, Nos. 451 and 452	10
10, Standard Peg Breaks, No. 453 to 456	10
10, Peg Breaks, No. 457 to 460	10
11, George Parr's Improved Boring Machines	20
11, J. Bentley & Co.'s Boring Machines	20&10
12, Parr's Brad Awls and Tools, No. 43 to 46	33⅓&10
13, Shouldered Brad and Pegging Awls	10
13, Sewing Awls	10
14, Saddlers' Awls	10
14, Patent Pegging Awls	10
15, Awl Hafts, No. 477 to 484	10
16, Saddlers' Awl Hafts	10
16, Chisel Handles, No. 486 to 500	10
16, File Handles, No. 501 to 504	10
17, Bench Screws, No. 505 to 506	20
17, Bench Hooks, No. 507	10
17, Auger Handles, No. 508 to 510	10
17, Chalk Line Reels, No. 511 to 514	10
18, Cold Chisels, No. 515 to 517	10
18, Tinsmiths' Punches and Nailsets, No. 518 to 521	10
18, Screw Driver Bits, No. 522 to 523	10
19–21, George Parr's Black Carving Tools	10 advance
22, Chucks and other Tools from No. 160 to 245	10
23, Circular Saw Attachment	net
23, Hand Planer and Tools	net
23, Planing Knives and Moulding Cutters	
24, Buffalo Pony Planers, single rollers, counter shaft and hangers, and extra cutters	
25, Door Panel Planer, counter shaft and extra cutters	
25, Buffalo Pony Planers, double rollers, counter shaft and hangers, and extra cutters	
26, Tool Chests, Practical Carpenter's, No. 1	10
27, " Mechanic's, No. 2	10
28, " Planter's No. 3	10
28, " Gentleman's, No. 4	10
29, " " No. 5	10
30, " " Nos. 6 and 7	25
31, " " No. 8	25
31, " Youth's Nos. 9 to 11	25
32, " " Nos. 12 to 14	25
33, " " No. 15	25
33, " Boys', No. 16 to 18	25
34, " " No. 19 to 23	25
35, " Family, No. 50 to 51	net
35, Ladies' Horticultural Chests, No. 60	10
36, " Garden " No. 61	10
36, Parr's Pocket Tool Chests, No. 70	25
37, Children' Garden Sets, Nos. 80 and 81	25
37, Parr's Portable Work Benches, Nos. 90 and 91	10
38, Boys' Complete Sets of Wood Saws, Bucks and Axes, No. 100 to 101	25
38, Gentleman's Foot Lathes, No. 110	10
39, " " " No. 111 to 113	10
40, " " " No. 114	10
40, Mechanics' " " No. 115	10
41, " " " No. 116	10
41, Tools for Lathes, No. 140 to 147	10
42, " " " No. 274 to 322	10
43, Sorrento Fret Cutting and Carving Tool Chest, No. 1600	10
44, Sorrento Fret Cutting and Carving Tool Chest, No. 1601 to 1602	10
45, Sorrento Fret Cutting and Carving Tool Chest, No. 1603 to 1604	10
46, Sorrento Fret Cutting and Carving Tools, No. 1610 to 1636	10
47, Sorrento Fret Cutting and Carving Tools, No. 1675 to 1708	10
48, Sorrento Fret Cutting and Carving Tools, No. 1709 to 1722	10
49, Ornamental Wood and Metal Cutting and Fret Saw Machine, No. 2800	
49, Carving and Fret Saw Machine, on ordinary lathe, No. 2801	
49, The Kinograph	
50, Parr's Serrento Carving, Turning, Sawing and Drilling Machine, No. 2749	10
50, Patent Scroll Sawing Machine, No. 2750	10

IRON.

American Pig.—The Iron market in all its branches exhibits almost complete stagnation. There seems to be no demand, and little disposition on the part of sellers to urge sales in the present state of the market. Our reports from Great Britain, both by mail and telegraph, indicate that affairs are about as bad there, with more room for prices to drop than there is here. There is no quotable change in prices, and the companies still generally refuse to sell for season delivery at present prices, though a good many orders have been booked at prices to be fixed hereafter. We note a sale of 2000 tons Foundry Iron by a leading Lehigh company, on private terms; also 200 tons Gray Forge at $28, cash, at furnace; this also in the Lehigh region. We quote without change: Foundry No. 1, $35 @ $36; Foundry No. 2, $33 @ $34; Gray Forge, $29 @ $31.

Scotch Pig.—There has been very little done during the past week. We quote Coltness, $43; Glengarnock, $40 @ $41; Eglinton, $38·50 @ $39. At last advices the number of furnaces in blast in Scotland was 117, against 120 a year ago, and the stock of warrants had increased 7000 tons since the first of January.

Bars.—Bars are still almost entirely neglected. Prices are difficult to quote, but 3 to 3·2 seems to be a fair average. A few mills still quote 3·3, claiming that all sales under that are made at a loss.

Rails.—There is no business to report in Rails. In the absence of transactions it is impossible to quote English, but the strong probability is that a cash offer would bring out a very low price. American are quoted to us at $59 @ $60, currency, without sales.

Old Rails.—We note sales of 1000 tons and 600 tons on private terms. We quote $40 @ $41.

Scrap.—Scrap is quotable without change, at about $42·50, from yard.

BRITISH IRON MARKET.

(Specially reported by cable for The Iron Age.)

WEDNESDAY, March 18, 1874.

Scotch Pig.—The market remains quiet. The demand is steady and amount of business fair. The following are makers' prices:

Coltness, No. 1	100/
Gartsherrie, No. 1	98/
Eglinton, No. 1	92/
Glengarnock, No. 1	96/

Rails.—Prices are firm and the demand improving, with a fair business. We quote Welsh, £9. 10/ @ £10.

Manufactured Iron.—The market remains as before reported—dull, and prices nominal. We quote Best Staffordshire Bars, £11. 10/ @ £13.

METALS.

Copper.—Lake is firm at 24¼c., cash. There has been little doing during the week, but the market has a strong undertone, with rather an upward tendency, manufacturers showing a disposition to buy more freely. We notice sales of 200,000 pounds Lake, in lots, at 24c. @ 24¼c. There is no demand for Copper for future delivery. The latest cable advices, 16th inst., report a strong market in London at £78 for Chili Bars and £88 for Best Selected. Manufactures of Copper have been well supported at the following quotations: Copper Bolts, 35c.; Sheathing (over 12 oz.), 33c.; Braziers (over 16 oz.), 35c. Yellow Metal is steady at 24c. per pound for Sheathing, and 30c. per pound for Bolts.

Tin.—The market has settled down to 25 @ 25½c., gold, for Straits, at which figures greater steadiness is observable, with a more cheerful feeling in this description, the cheapest lots in the market having been picked up. The market for English Tin has been in a demoralized condition, with a good deal doing on the spot, to arrive, and for shipment, L & F having been done as low as 21¼c. for shipment, and Fine English at 23c., to arrive. The tendency has been steadily downward, and the market closes quiet. During the late panic in Holland, Banca went even lower than the cable reported, say to 61¾ guilders. The Dutch Trading Society will sell 22,500 slabs Banca and Billiton on the 25th instant. The deliveries to consumption of both slabs and plates were on a liberal scale, and great confidence was expressed at the low rates reached, London, March 14, £94. Plates have also been easier, sales summing up 1300 boxes within the following range, closing steadier: I. C. Charcoal, $10·50 @ $10·75; I. C. Coke, $7·75 @ $8·25; Coke Terne, $6·75 @ $8; Charcoal Terne, $9 @ $9·75.

Lead.—This metal has been quiet, with a moderate demand at 6¼c., gold, for domestic, 6¾c. @ 6¾c. for Spanish, and 7¾c. @ 7¼c. for foreign selected. The European markets recover with difficulty from the late decline, notwithstanding the fact that the situation in Europe, from a general point of view, and especially the state of affairs in Spain, may be set down as decidedly favorable to holders. Money is cheap in Europe, and promises to remain so for months to come; hence the metals, whose production during the current year can be approximately measured, like Copper, Lead and Spelter, are likely soon to be supported once more by the speculative element. Our market closes inactive but firm. Bar, Pipe and Sheet, 9c., less ten per cent. to the trade.

Spelter and Zinc.—While we have a fair supply on hand, the business of the week has been but light. We quote domestic Spelter at from 7⅛c. to 7¼c., currency. Of Silesian the stock is small. We quote the same as follows: Silesian, Schlesischer Verein, 6¾c., gold; C. G. H., 6⅞c., and W. H., 7¼c. The market closes inactive, but firm. Sheet Zinc is in moderate request, and unaltered.

Antimony.—We continue amply stocked in first hands to meet the light demand prevailing at from 12¾c. to 13c., gold. It is well known, however, that consumers have no supply on hand to speak of, but they operate with a great deal of caution.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending March 17, 1874:

Hardware.

Armstrong M. & Son, Cases, 2
Amsinck L. E. & Co. Iron tools, cs., 2
Beam & Murray, Mdse. pkgs., 1 Chains, cks., 31
Booth R. W. & Co. Anvils, 54
Boker Hermann & Co. Cases, 6 Cutlery, cs., 5 Casks, 1
Field A. & Co. Packages, 34 Chains, cks., 8
Fuller Bros. Casks, 2 Cases, 1 Chains, cks., 43 Links, cks., 1
Fisher J. L. Casks, 7
Grainger & Smith, Wire, cs., 100
Harmar, Hayes & Co. Packages, 3
Jackson R. D. Packages, 5 Casks, 1
Jackson Wm. Files, cks., 1
Lau & Garlichs, Mdse. pkgs., 4 Casks, 2
Langhland & Co. Wire, pkge., 52
Lamarche H. Arms, cs., 19
Lennox E. S. Wire, lots, 307
Mason John W. & Co. Wire rope, coils, 5
Merchants Dispatch Co. Cases, 1 Casks, 3
Markt & Co. Cases, 80
Noyes, White & Co. Casks, 2
Rosenfeld Bros. Cases, 2
Roosevelt S. & Co. Casks, 1 Chains, cks., 11
Spies, Kissam & Co. Guns, cs., 2
Smith, Cohu & Co. Casks, 2 Chains, cks., 2
Simmons Hdw. Co. Cutlery, cs., 5
Schuyler, Hartley & Graham, Per. caps, cs., 4 Mdse. pkgs., 11
Schoverling & Daly, Mdse. pkgs., 1
Tomes, Melvain & Co. Cases, 1
Tillotson L. G. & Co. Cases, 1
Wolfe W. & Co. Casks, 2
Wiebusch F. Cases, 11
Order. Casks, 12 Cases, 3 Packages, 5 Iron wire, cks., 19 Wire rods, bdls., 9 Files, cks., 4

Iron.

Crocker Bros. Pig, tons, 300
Elbers Alexander D. Bundles, 387
Goddard & Bros. Boxes, 100
Henderson Bros. Pig, tons, 600
Lang W. Bailey & Co. Bars, 131 Bundles, 50
Laughland & Co. Hay bands, bdls., 200
Naylor & Co. Fish plates, bdls., 394
Order. Pig, tons, 154 Rails, 604 Spiegel iron, lots, 1 Iron rods, bdls., 155

Steel.

Brown Wm. Cases, 13
Congreve Chas. & Son, Rails, 1057 Mdse. pkgs., 1015
Crocker Bros. Bessemer, tons, 100
Drexel, Morgan & Co. Tubes, cs., 20
Hogan John. Cases, 34 Casks, 2
Jackson Wm. Packages, 10 Bundles, 16
Kennedy J. S. & Co. Bars, 207
Moore Henry. Cases, 29 Casks, 6
Naylor & Co. Cases, 67 Tires, 4
Van Wart & McCoy, Bundles, 120
Order. Bales, 55 Bessemer, rods, bdls., 137 Bundles, 1890 Bars, 41 Casks, 12

Metals.

Arkell, Tafts & Co. Tin, ingots, 1100
Byrnes Joseph & Co. Tin plates, bxs., 1696 Tin, ingots, 1083
Bruce & Cook, Tin plates, pkgs., 335
Baxter John & Son, Lead, bars, 76
Cort N. L. & Son. Tin plates, bxs., 240
Dickerson J. S. & Co. Tin plates, bxs., 697
Hart L. & Co. Tin, ingots, 300
Harley Geo. Copper, pkgs., 66
Naylor & Co. Tin plates, bxs., 260
Phelps, Dodge & Co. Tin and terne plates, bxs., 39,080
Pacific Mail S. S. Co. Copper, bars, 5
Richardson J. S. & Co. Tin plates, bxs., 888
Ward James E. & Co. Scrap metal, bxs., 35; hhds., 3
Order. Tin plates, bxs., 5171 Tin, ingots, 760

PHILADELPHIA.

PHILADELPHIA, March 17, 1874.

There is very little doing in the Iron market, and no disposition to do any more. The furnace companies are quietly disposing of their Iron as wanted for the comparatively light consumption of the moment, and not troubling themselves as to the future. Some parties appear to believe that the end of the dull time has arrived, and that from this date trade will revive, without, however, any substantial reason for these views. Prices of Pig metal are without change, however, and the volume of business very small indeed for the season. Manufactured Irons are somewhat more active, and a close investigation shows that none of the city mills, at least, have sold, or will sell, Bars as low as 3 cts. per lb. Rails are in fair request at the low figures of quotation, but both Old Rails and Muck Bar are much more active, showing an expected demand for Rails hereafter. A good deal of notice has been taken in iron circles of the statement in the annual report of the Pennsylvania Railroad Company—that this great road and its connections are now thoroughly supplied with rolling stock, locomotives, cars, etc., and will not require further outlay in this line for some time to come. This is considered as arguing a dull year for car works, and consequently for bar mills; and the further expression of opinion, which is well sustained by argument, from the same source, that the country is abundantly provided with trunk lines for the transportation of freight, will also have its effect upon railroad speculation. From these data some parties argue a very dull season, and are thus far supported by the evidence of current facts.

The following quotations fairly represent the prices current for Iron in this market:

PIG IRON.—No. 1 Foundry, $35; No. 2, $33. Gray Forge, $30.

BARS—3·2c. to 3·3c. per lb.

RAILS—$65, at works.

OLD RAILS—$42 to $42·50.

SCRAP—$40 to $41 for choice selections.

The sales include 1500 to 2000 tons Foundries at quotations; 2000 tons Old Rails at $42·50, here; 1500 tons Muck Bar, $46, and some considerable sales of Rails for New York account, at prices said to be better than $65, at works. The market is very quiet and apathetic in tone.

PITTSBURGH.

PITTSBURGH, March 14, 1874.

PIG IRON.—Trade continues exceedingly dull. Commission merchants report that this market has not been so much depressed at any time since the panic as during the past few weeks. There is a difference of from $1 to $3 per ton between buyers and sellers, hence there is a dead-lock; the latter, as a rule, are buying only for immediate requirements, although if concession were made there would, no doubt, be considerable activity for a time, but there is very little good Iron offering at any reduction, consequently trade is almost entirely dead for the time being. Commission merchants state that they could place considerable Mill Iron at $28, cash, and $29, 4 mos., but makers, very generally, are holding their best brands at $29 and $30, cash and time, and some holders are still refusing to sell under $31. The feeling seems to prevail among operators generally, that standard Forge Irons are good property at present rates, although, as already stated, buyers are still holding off, being apprehensive that there might possibly be a still further shrinkage. Producers in the Mahoning and Shenango Valleys cannot, so your correspondent is reliably informed, lay down Pig in this market, even at the reduced cost of ore, fuel and labor, at present asking rates and get back dollar for dollar; and it is pretty certain, therefore, unless there is a very decided improvement in the market, that many of the furnaces will soon be obliged to blow out, as stocks are accumulating in first hands, and the situation, so far as the producing interest is concerned, instead of improving, seems to be growing worse. Furnaces located in this immediate vicinity, it is stated, can make and turn out good Forge at a cost of $27·50 to $28, hence present asking rates, $29 to $30, would afford then a slight margin. However, notwithstanding the depressed condition of the market at this writing, an early improvement in the demand is almost certain, as many of the mills will soon be forced to buy or stop, and as they are all full of orders, some of them sold a month ahead, it is not at all likely that they will stop. There is no demand worthy of the name for Foundry Irons; indeed, there is not enough doing to establish quotations. No. 1 may be quoted nominally at $33 to $35, 4 months, and No. 2 at $30 to $32; White and Mottled, $26 to $28. Charcoal Irons are very dull, and the low price of Anthracite has almost driven them out of market, as consumers, as a rule, cannot think of and will not, if they can avoid it, pay the difference. There is rather more doing in Blooms, but prices are nominally unchanged, ranging from $90 to $100, according to quality.

MANUFACTURED IRONS.—While it is true that orders are not coming in as freely as they did a month ago, it is also true that the mills are all busy, and with very few, if any, exceptions running to their full capacity; and while there is, although this is nothing unusual, considerable complaining about fine margins, there seems to be no particular apprehension in regard to orders there is every appearance of a full average spring trade. Your correspondent was informed by one of our oldest firms yesterday that their trade in January and February was the largest they ever had since they have been in business, and we do not believe this to be an exceptional case. Trade has been very active all winter, and as stocks are known to be very much reduced, both in the hands of jobbers and consumers, there is every indication that it will continue so during the balance of the season. As noted in my last, prices are softer, in sympathy with the raw material, but it seems to be pretty generally conceded that any further shrinkage is very improbable, as the reduced cost of Pig has been fully discounted already. Sales for immediate delivery are being made on a basis of $2·75 to $2·80, net cash, for bars, but orders for future delivery could not be placed under one to two-tenths additional. The fact is our manufacturers, with very few exceptions, are unwilling to contract ahead if they can avoid it, as they have discovered that it don't work satisfactorily.

NAILS.—The market for Nails, both here and at Wheeling, continues active, and notwithstanding the mills are all running to their full capacity, they are unable to keep up with their orders, and prices are firm but unchanged—$4 for 100 keg lots and upward, with usual discount of two per cent. for cash, which brings the actual cash price down to $3·92 per keg. Manufacturers do not seem to have any apprehension in regard to a full average spring trade. Some are expecting even more, but, as in the case of iron, it is complained that prices are low, and that margins are small.

STEEL.—The Steel mills are also reported busy, working up to their full capacity, and there is every prospect of a heavy spring and summer trade. Business in this particular branch seems to be increasing here in Pittsburgh every year, and since American has gone into general use the prejudice in favor of foreign has almost subsided, as it has been demonstrated that the former, as a general thing, is fully equal to the latter, in addition to being so much cheaper.

SCRAP IRON—Continues exceedingly dull and depressed, in sympathy with Pig, but dealers are hoping for and expecting an improvement in trade next month, and it is earnestly hoped that their expectations may be fully realized, as trade has been very dull and unsatisfactory for a year or more past. The probability is that dealers generally closed last year with the profit and loss account on the wrong side.

COAL.—There is no improvement in this important interest, nor is it likely that there will be for some time to come. It is generally conceded that operators are making little, even taking the reduced cost of mining, towing, etc., etc., into consideration. All the down river markets are glutted, and present prices scarcely cover actual cost of putting it there, say nothing about risk, interest on investment, etc., etc.

The Pittsburgh *Commercial* of March 14th says: The market for raw Irons continues extremely dull, and the sales aggregate even less than last week, and we see but little, if any, indications of a movement in the near future. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

200 tons Close Gray Mill	$29·00—4 mos.
100 tons Gray Forge Red Short	29·00—5 mos.
100 tons Gray Forge	30·00—4 mos.
50 tons Gray Forge	28·00—cash.
20 tons No. 1 Foundry	35·00—4 mos.
20 tons No. 1 Foundry	33·00—4 mos.

ANTHRACITE.

150 tons Gray Forge	$28·00—cash.
100 tons Mottled	27·00—cash.
200 tons Gray Forge Neutral	29·00—4 mos.
50 tons Gray Forge Neutral	28·00—cash.
20 tons Silvery	28·00—4 mos.
10 tons No. 2 Foundry	32·00—4 mos.

LOUISVILLE.

Mr. GEO. H. HULL, under date of March 16, writes us as follows: The market is dull for all grades of metal, and prices are lower. The usual time, four months, is allowed on quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$38·00 @ 40·00
" 2 " " " "	34·00 @ 36·00
" 1 Forge, " " "	31·00 @ 32·00
" 1 F'dry, from Tennessee Ores	35·00 @ 40·00
" 2 " " "	33·00 @ 35·00
" 1 Forge, " "	30·00 @ 31·00
" 1 F'dry, from Alabama Ores	35·00 @ 38·00
" 1 " " Iron Mountain Ores	41·00 @ 42·00

HOT BLAST STONE COAL.

No. 1 F'dry, from Missouri Ores	34·00 @ 36·00
" 2 " " "	32·00 @ 33·00
" 1 Forge, " " "	30·00 @ 31·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	60·00 @ 63·00
" " Tennessee Ores	53·00 @ 55·00
" " Alabama Ores	55·00 @ 57·00
" " Georgia Ores	55·00 @ 57·00
" " Missouri Ores	53·00 @ 57·00
" " Kentucky	55·00 @ 57·00

CINCINNATI.

Messrs. ADDY, HULL & CO., under date of March 16, write us as follows: There appears to be more disposition on the part of buyers to come into market at the present low figures. Sales of round lots Hot Blast Mill and Foundry grades have been made under concessions by furnaces. In car load lots prices are moderately firm at quotations. Car Wheel Irons are meeting with some demand at low prices.

HOT BLAST CHARCOAL.

Hanging Rock No. 1 ₩ ton	$38·00 @ 40·00—4 mos.
" " No. 2	35·00 @ 37·00—4 mos.
" " Forge	30·00 @ 32·00—4 mos.
Tennessee No. 1	35·00 @ 37·00—4 mos.
" Forge	30·00 @ 32·00—4 mos.
Alabama No. 1	35·00 @ 37·00—4 mos.
Missouri No. 1	38·00 @ 40·00—4 mos.
" No. 2	35·00 @ 37·00—4 mos.

HOT BLAST STONE COAL.

Missouri No. 1 ₩ ton	$37·00 @ 38·00—4 mos.
" Forge	30·00 @ 32·00—1 mos
Ohio No. 1	33·00 @ 36·00—4 mos.
" Forge	30·00 @ 31·00—4 mos.
Scotch Pig, No. 1	

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel ₩ tn.	$55·00 @ 60·00—4 mos.
Missouri " "	55·00 @ 57·00—4 mos.
Kentucky " "	55·00 @ 57·00—4 mos.
Tennessee " "	55·00 @ 57·00—4 mos.
Georgia " "	55·00 @ 57·00—4 mos.
Alabama " "	55·00 @ 57·00—4 mos.
Machinery and Forge	55·00 @ 57·00—4 mos
Blooms	100·00 @ 110·00—4 mos.

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, reports us the following prices under date of March 17, 1874: Trade has ruled very quiet for the past week, and quotation figures shaded for desirable specifications, and those are only issued to supply immediate pressing wants.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick	3¼c. to 3½c. per lb.
1 to 4½ wide by 1½ to 2 thick	3¼c. to 3½c. "
Round and square, ordinary sizes, from ⅜ to 2 inclusive	3¼c. to 3½c. "
Hoop Iron, 1½ wide and upward	4¼ to 5c. per lb.
Band Iron, from 1¾ to 4 in. wide	4 to 4½c. "
Horse Shoe Iron ⅜ to 1 wide by ⅜ to ⅝ thick	5·87½c. "
Norway Nail Rods	7½ to 8 c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	16½c. "
Machinery Steel	11½c. "
Cast Spring Steel	11c. "
Homogeneous Steel Plate	13c. "
Perkins' Horse Shoes, per keg of 100 lbs	$5·87½
Mule Shoes " "	6·87½

Common Horse Nails, from 14c. to 18c per pound.

	10	9	8	7	6
Putnam Horse Nails	23	24	25	26	28c. per lb.
	10	9	8	7	6
Globe Horse Nails	23	24	25	26	28c. per lb

R. R. Spikes ..... 5½ by 9-16 at 3¼c. to 4c. per lb.

BOSTON.

BOSTON, March 14.—The demand for both Bar and Pig is very quiet, and our quotations are entirely nominal, and without change since our last. We quote yard lots of American Pig Iron at $36 to $41 per ton, including No. 2 extra at $36 to $38, and No. 1 at $39 to $41. We quote Eglinton at $45, Coltness at $49, Charcoal at $50 to $60. American and English Refined Bar Iron is selling at $72·50 to $83 per ton for the ordinary sizes, and $88 to $92 for extra sizes, according to size. Cast Steel is selling at 16c., gold, for English, 18c., currency, and 14c. to 15½c. for American, currency, with fancy brands of English selling at 17c., gold. Anchors are selling at 8½c. per lb.; Chain Cables (⅝ to 2 inches thick), 7c. to 8¾c. per lb.; Coil Chains, 7½c. to 16c. from 3-16 to 1¼ inches. We quote Boiler Plates at 6½c. to 7½c. for Flanges, 4¾c. to 5c. for C No. 1, and 4¼c. to 4⅝c. per lb. for Common and Tank. Russia Sheet is selling at 18c., gold, and 20c., currency, for perfect lots. English and American do. are selling at 6¾c. to 8¼c. per lb. currency. We quote Galvanized Sheet Iron, No. 20, at 11c.; Nos. 21 to 24, 12c.; 25 and 26, 13c.; 27, 14c.; 28, 15c. Nails are selling at $4·25 for 10d to 60d, and other sizes at a range of $4·50 to $8·25 per 100 lbs., less discount of 15c. per keg to the trade on 100 keg lots. Horse Nails, 28c. No. 7.—*Commercial Bulletin.*

CLEVELAND.

CLEVELAND, March 14.—During the past fortnight there has been a perceptible falling off in the demand for iron, and prices, in sympathy, have weakened. A sale of 1000 tons Charcoal Bessemer Iron is reported at $40, six months, and Bituminous at $33, for about the same amount. There is at present a fair demand for Car Wheel Irons, but the competition between the different car works is so brisk, and bids are made at such low prices, that consumers cannot afford more than moderate prices for Pig Iron.

ST. LOUIS.

Messrs. GARRETT, MCDOWELL & Co., under date of 14th inst., send us the following: Since our last report the Pig Iron market has been quite steady, with a fair demand for all grades for consumption at firm prices, and a respectable amount sold for the week. The market is now firm at quotations below, for cash, at the furnaces and in yard.

HOT BLAST STONE COAL

No. 1 Foundry, from Iron Mountain and Maramec Ores	$34·00 @ 35·00
No. 2 Foundry, from Iron Mountain and Maramec Ores	32·00 @ 33·00
No. 1 Forge, from Iron Mountain and Maramec Ores	29·00 @ 31·00
No. 1 Foundry, Massillon, O	43·00 @
No. 1 " Tennessee Cold Short	36·00 @
No. 1 " Ohio Cold Short	40·00 @

HOT BLAST CHARCOAL.

No. 1 Foundry, from Iron Mountain and Maramec ores	36·00 @ 43·00
No. 2 Foundry, from Iron Mountain and Maramec Ores	32·00 @ 40·00
No. 1 Foundry, from Tennessee ores	35·00 @ 37·00
No. 1 Forge, " "	31·00 @ 33·00

COLD BLAST CHARCOAL.

Car Wheel, from Hanging Rock Ores	60·00 @ 64·00
" " Tennessee or Alabama Ores	57·00 @ 60·00

FOREIGN.

GREAT BRITAIN.

Messrs. J. Berger Spence & Co., London, Glasgow and Manchester, under date of Feb. 28, 1874, report:

Metals.—The depression ruling in this market has not been lessened by the operations of the past week, during which further reductions have been made, but have not resulted so far in any great increase of business. Scotch Pig Iron Warrants are in moderate demand, and close quiet. Makers' Iron is easier. The shipments for the past week amounted to 9256 tons, against 12,312 tons in the corresponding week of last year. Middlesborough Pig Iron remains nominally at about the same rates as those quoted in our last, but there is considerable underselling going on both by merchants holding second-hand lots, and by some of those makers who were not fortunate enough to secure orders at the commencement of the year. Manufactured Iron is in little demand, and complaints are rife from all districts of the exceedingly dull state of trade; when and how this state of affairs is to end is a problem which is puzzling all to construe. Copper is in rather better inquiry, but without any change in values either for Chili Bars, or English Tough and Manufactured. Another reduction has been made in Tin, both for Straits and British. Lead is also sharing in the general dullness, and slightly lower prices have been accepted. Spelter is very quiet, and until there is an improvement in the galvanized trade is likely to remain so.

IRON—"Ayresome" Yorkshire Pig Iron, No. 1, 95/; No. 2, 90/; No. 3, 87/6; No. 4 (Foundry), 85/; No. 4 (Forge), 85/ net cash, or 2/ extra 4 months' bills. Scotch Pig warrants, 87/6 to 90/. Staffordshire Bars, £12 to £14. Hoop Iron, £13 to £14. Gas Tubes, 52½ per cent. off new list. Boiler Tubes, 30 per cent. discount.

COPPER.—English Tough Ingot, £88 to £90. Chili Bars, £77 to £79.

TIN—English Ingot, nominal, £104 to £105. Straits, £99 to £100.

TIN PLATES.—Best Coke, I. C., 28/ to 30/; Charcoal, I. C., 36/ to 40/ per box.

LEAD.—Best English Soft Pig, £22. 10/ to £23. Refined Red Lead, £26 to £27.

ANTIMONY.—French Star, £53 to £54.

SPELTER.—Silesian, £24 to £25. English, £23 to £24.

FRANCE.

(*Moniteur des Interets Materiels.*)

PARIS, March 1, 1874.—*Metals.*—To our regret we have to continue from here the same doleful accounts about the general metal situation in Europe hitherto sent. The tendency is a decidedly bad one; holders are compelled to grant unusual concessions in order to bring about some few sales. *Copper.*—Great stagnation prevails, and a fresh lowering of prices would seem necessary ere anything of moment can be accomplished. Stocks exceed present requirements, nor can we discern any probable falling off in the arrivals. Thus Chili has been fluctuating between £76.10/ and £79 in the London market, and has settled down to £77.10/ to £77.15/, cash. Paris is stagnant, at 205 francs for Chili bars; Havre is heavy at the same figure. Marseilles is again weaker. The Scandinavian and Russian markets are paralyzed through decreased consumption. The English failures have had a bad effect in those localities. While the German markets in general are weak, Berlin forms an exception, there being a good local demand. Hamburg and Stettin are altogether nominal. *Tin* is as dull as ever. The arrivals from Australia are copious, and as long as they do not cease pouring in, we can hope for no upward reaction. London has dropped to £99 to £100 for Straits. Our Rotterdam correspondent writes us to the following effect: "The English decline has produced a sort of panic among us. The last auction's tin had to be received on the 28th February, but the purchasers, rather than be saddled with the metal, resold it as fast as possible to actual consumers, who do not lack confidence in prevailing rates, and have thus taken 12,000 slabs." Paris and Havre are paralyzed at 206 francs, Banca. Marseilles is week at 200 francs for Straits. The German markets are apparently at a loss what to make of it; the only quotations telegraphed to us are from Stettin, nominally 42¼ to 43 thalers, and from Hamburg, 128 marks, all Banca. Singapore, per cable, declined from $33·25 on the 22d January, to $29·50 on the 20th ultimo. *Lead.*—Confidence in the staple revives with difficulty, and great irregularity is the consequence. In order to effect sales of moment, holders would again have to subscribe to important concessions, but they show great firmness, despite the discouraging tendencies that surround us in Europe in metals generally. While English Lead at London is nominally upheld at £23. 10/, quite a break has been brought about in our own midst at Paris, where we have gone off to 57½ francs. Marseilles is also apathetic at 55. In Germany, by common consent, the markets abstain from doing anything at all, and quietly wait for the watch word from London. *Spelter* has been entangled in the same listlessness together with the other metals. The outlook is a poor one all around, and holding out no hope of a speedy amelioration. London, with trifling sales of Silesian, is £24. Paris is steady at 66 francs the 100 kilos. Little doing at Marseilles. Germany quiet and unaltered. *Iron.*—Accounts from the various Iron centers in France are, if anything, more cheerful, except from the Nancy district. We are at length able to furnish statistics of last year's Iron and Steel production in our country, that of Pig Iron having been 1,381,000 tons, against 1,398,000 the year previous; of Wrought and other kinds of Iron 906,745, against 883,079 in 1872. Of Steel we have produced 167,677 tons, against 138,552, being ten-fold what we turned out in 1867. We have delivered of dometic made Rails 188,815 tons to our railroad companies, 124,717 of which were Iron and 64,098 Steel. *Coal* is still on the decline. The general expectation had been that so important a coming down of prices would stimulate a general revival in manufacturing circles, but industry is in such an unsatisfactory condition in France, that even low Coal seems to have lost its power.

BELGIUM.

(*Le Commerce.*)

BRUSSELS, Feb. 28, 1874.—*Iron.*—The crisis which Europe is traversing in metallurgical affairs just at present, although perhaps less intense in Belgium than during the winter time, still exercises a most depressing influence on the metal trade and industry, including Iron. Some orders have dropped in, it is true, for Iron buildings, Rails and Sheet Iron, imparting life throughout the districts that were fortunate enough to receive them, but on the whole we are still in rather a poor plight, which does not prevent prices from showing a good deal of firmness now. As had to be expected, the great coal decline has carried down the market value of Pig Iron, both in Belgium and the neighboring Grand Duchy, to 80 francs, which is the now established rate for it. This is a remunerative figure, and with greater animation we shall be doing well on it. Some people seem inclined to think that Iron consumption in Europe is diminishing, but we do not agree with them. From what we have been able to ascertain consumption by the masses is proceeding unrestricted, the dealers are light stocked and manufacturers, after the severe lessons of the past six months, only wait to see what they deem the lowest price, in order to vigorously re-enter the markets. *Coal.*—The Coal companies subscribe to almost any condition for the sake of effecting a sale. Wages in the Coal districts are following in the wake of the Coal decline, and the miners submit to the lowering without a word of complaint, the more so as a good many rolling mills have stopped work, and some blast furnaces are simply engaged in stowing away their late production. The Coal panic rages at Liege more intensely than elsewhere, although Charleroi is not much better off.

LATEST LONDON TIN TELEGRAM.

LONDON, March 14, 1874.—Straits Tin declined to £94.

HOLLAND.

(*Koch & Vlierboom.*)

ROTTERDAM, March 3, 1874.—*Tin*—The market is in a dull mood. Banca, immediate delivery, has fluctuated between the following figures: 62, 62½, 62, 61¼ and 62 guilders, and deliverable from the March sale, between 63, 62½ and 63, May 62½. Billiton afloat has been done at 62.

STOCK ON WARRANTS WITH THE TRADING SOCIETY.

	1874. Banca. Slabs.	1874. B'ton. Slabs.	1873. Banca. Slabs.	1873. B'ton Slabs.
In first and second hands	137,210	3,167	119,165	300
Jan. and Feb. deliveries	18,283	....	13,301	1,631
	Piculs.		Piculs.	
Afloat from Banca	3,550	....	27,830	....
	Slabs.		Slabs.	
Stock of Billiton in private hands	21,153	....	22,500	....

Next auction, March 25.

PRICES ON MARCH 1.

1874.	1873.	1872.	1871.	1870.	1869.	1868.
62	84	85	77¾	70	78	54.

Both Tin and Tin Plates are moving off steadily. An improvement seems certain, and we consider present prices sufficiently safe to invite speculation.

SOUTH AMERICA.

(*H. Fischer & Co.*)

VALPARAISO, Jan. 29, 1874.—The Chilean International Exhibition will open at Santiago on the 16th of September, 1875, and will be represented in the United States by the following gentlemen: The Chilean Minister at Washington, Hon. F. Gonzalez Errazurij; Consul W. Booth, Baltimore; Consul Edward Shippen, Philadelphia; Consul General Francisco Segundo Casanueva, San Francisco; Mr. Felipe Fierro, San Francisco; and at New York by the following Commissioners of the Board of Directors: Mr. Stephen Rogers, Consul of Chili; Mr. J. B. Casablanca, Mr. Walter W. Evans, Messrs. Robert E. Kelly & Co., Messrs. Fabbri & Chauncey, Messrs. Ribon & Munoz, and Mr. A. Villaroel, Corresponding Commissioner. At the first exhibition held in Chili, the United States were insufficiently represented. It is to be hoped, in the interest of American industry, that timely application will be made to the foregoing gentlemen on the present occasion. *Copper*—Bars have been in request during the past fortnight, and all lots arriving from the interior have been promptly taken at $17·85 from Coquimbo, and $18 from here, on shore, at which rate the market closes with firmness. A good deal of interest was manifested in parcels on the coast, with steam freight engaged, especially so on receipt of more encouraging news from England, and 90 tons were taken off Coquimbo at 55/ freight, and $18·45 on shore; and 250 off Caldera at 60/, and $18·20, cash, on board. Holders declined $18·20 for Guayacan, now held at $18·30. There is no Lota in the market. Of Regulus a cargo was sold at $7·45, on board. Of Ore no sales have transpired. Sales, 12,460 quintals Copper and 14,500 Regulus. For Ore $3 is offered, 25 per cent. *Exchange*—60 and 90 days, 44¼d. to 45¼d.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

SHEFFIELD, Eng., March 3, 1874.

THE IRON TRADE OF SOUTH WALES.

I feel compelled to give prominence in this communication to the South Wales district for more than one reason. In the first place, the drop in quotations for rails—of which important fact *The Iron Age* was enabled through me to publish the first announcement on either side of the Atlantic—merits rather more than a mere passing allusion. You will, perhaps, recollect that I mentioned in my last letter the fact that the Welsh iron masters, with their unrivalled stores of iron ore and coal on the very spot, were preparing to move heaven and earth in order to secure all the rail orders in the market. Soon after that communication was dispatched, I became aware, through special sources opened up for the early and accurate information of the subscribers to this journal, that the iron kings of the Welsh valleys were sending out tenders in various directions for rails at the lately unprecedentedly low figure of £9. 15/. Had I not been able to rely with the utmost confidence upon my informant, I should have hesitated to convey the intimation to you, but I did so, and was amply justified by the further information which has now reached me, that quotations are currently, in many instances, as low as £9. 10/. The cable will have given you these figures long before you receive this. The fact is, I take it, of no little importance to the American iron trade generally. What, one may very naturally ask, is the ruling motive for this sudden and considerable fall in prices? The *Ironworkers' Journal*, edited by Mr. John Kane, secretary of the Amalgamated Iron Workers' Association of Great Britain, has the following remarks on the matter, apart from the question of quotations:

"It is to be regretted that there does not appear to be any improvement in the state of trade (in South Wales). Hundreds of men are walking about in every district and fail to find employment. It is a trying time for many a poor family; what the end may be is unknown, and it is well that it is so. We need not say that the chief cause of this unfortunate state of things is due to the shameful price of coal. Mine owners may thrive and fatten on the good things that famine prices have brought about; but the iron manufacturers, who have to purchase their coal and pig and iron at a time when the number of purchasers is seriously reduced is so considerable that serious consequences to labor and to the masters so circumstanced have been brought about. In the North of England an order for rails is difficult to get hold of. This is chiefly caused by the reduced demand, and what orders there have been of late, and are coming into the market now, are taken by Welsh houses, who can take an order and make it pay, in consequence of cheap labor and cheap coal. It is a shame that the employers in Wales should be permitted to pay from 8/6 to 9/ per ton for puddling gray pig iron. This is so important that the attention of the workmen must be called to consider this act of injustice at the first opportunity. The workmen's wages must be advanced in Wales before the inequality of rates is removed. The above facts have been seriously considered by many. The time must come for action to be taken in the direction indicated in these remarks. The question is ripe for discussion. This is the proper time for pushing the principle of arbitration, which may be the means of settling this dispute by reason instead of by brute force. In the meantime we hope that those who have work will not fail to send assistance to those who are still idle."

This is not very far from being the exact truth. *Cheap coal* enables the Welsh ironmasters, most of whom are also extensive owners of coal mines, to come into and undersell all Great Britain in rails. They have upheld prices as long as possible, but now, having large stocks of iron and fuel on hand, they are bringing their energies and influence to bear in quarters where becoming pressure rarely fails. When they have secured a fair meal, I suppose the less favored iron men of other districts may have a bite. The great fact, however, which is now not less evident than it has been any time these two years, is that no ironmaster or iron firm can hope to compete, on a really sound, equal footing, unless the coal mine be owned as an adjunct to the ironworks, and, if possible, the iron mine should be added as a further safeguard. Some of the Cleveland and Sheffield firms have recognized this and have acquired both ore and fuel sources of supply. These have a moderately good chance, even in a keen competition, but such firms as have not these advantages are absolutely nowhere—out of the race entirely.

ONCE MORE!

Once again rises up the spectre—the ghastly, warning spectre—of *foreign competition*. The shape in which this *bete noir* appears on this occasion is not highly horrifying, but still there is a lesson derivable therefrom. Briefly, then, it is stated that on Thursday last, on the Birmingham Exchange, a contract for iron sheets of Belgian manufacture, twenty wire gauge, was concluded at the rate of £9. 16/ per ton, delivered in London, Staffordshire sheets being quoted there at £14 to £15 per ton. Deducting the cost of conveying these Belgian sheets from London to Birmingham, it is pretty clear that at the figures given they can be delivered in that town at £3 per ton less money than is asked for the commonest kinds of Staffordshire sheets! This is carrying fire and sword into the enemy's country with a vengeance! The Belgian iron is doubtless inferior to Staffordshire in quality, but the margin of price is so wide that its use for purposes where quality is of little or no moment might become widespread, even in our own iron districts. The fact is there, and, as Cap'n Cuttle was wont to observe, is worth "making a note on." If the Belgian iron trade does not improve, I suppose we shall have frequent repetitions of this kind of thing, not only in Great Britain, but in the United States.

IS CAST IRON "FIRE-PROOF?"

This question, brought to the front by the great fire at the London Pantechnicon, is far from being disposed of. Many arguments, of especial interest to girder makers and the trade generally, are advanced, but there is, I believe, a prevalent idea that cast iron, when exposed to a great heat, does not possess—or, rather, retain—cohesion enough to support any great vertical or other pressure. Some people advocate wood, others brick, and a very few stone. As wood appears to meet with some favor, and seeing that that material enters largely into the construction of some of the American cities, I here reproduce the observations of Capt. Shaw, Chief of the Metropolitan Fire Brigade, well known as a thoroughly practical man. He says:

"A few months since a fire occurred in one of the enormous warehouses for which the docks of this metropolis are remarkable, and raged with great fury from a little before six o'clock in the morning until about eleven in the forenoon, when it was extinguished, and a very large proportion of the building and its contents saved. The warehouse was constructed of brick walls; it had wooden floors, supported on wooden beams, which in their turn were carried on wooden storyposts about 12 in. thick; and, although serious damage was done, not one portion of the heavy wood work was destroyed. After the fire I was allowed to remove one of the storyposts, with a section of the beams and other parts surrounding it above and below. This post had been subjected to the full action of the fire during the whole of its duration, as already mentioned, or, making full allowance for everything, including the delay of the fire attacking the particular spot on which it stood, and the time at which the cooling process commenced, certainly not less than 4½ hours. As we had used large quantities of water, and it was probable that the wood might have been somewhat saturated, I had it carefully dried for several days before a strong fire, until not a trace of moisture remained in it. I then set it on end in an open yard, exactly as it had stood in the warehouse, with the pedestal underneath, the cap above, and the beam across the cap, placed more than a ton of shavings, light wood, and heavy wood round it, and after saturating the whole heap with petroleum applied a light to it. After this I kept men pumping petroleum and turpentine upon it until my stock was exhausted. At the end of 2½ hours I withdrew the post, beam and other parts from the fire, and within a few minutes from the time at which they were withdrawn they ceased to burn. I then sawed off horizontally a few feet at that part which had suffered most from the flames, and afterward split the same piece longitudinally with steel wedges in order to examine its condition. The post was of pitch pine, about the most inflammable wood I know, and yet after exposure for seven hours to fires the fury of which could not be exceeded except in blast furnaces, it contained, and still contains within it a quantity of perfectly uninjured and apparently fresh wood, probably capable at this moment of supporting the whole weight which the original post can have been designed to carry. Immediately after the saw cut, and again after the cleaving with steel wedges, I carefully examined the center, and found it just perceptibly warm to the touch, but nothing more, thus proving that the fiber in which the strength lies must have been quite uninjured. The lesson to be drawn from this I take to be as follows: A massive storypost of even the most inflammable wood is absolutely and perfectly proof against any heat which can be applied to it, will not of itself burn at all, but requires a continual supply of highly inflammable substances to keep it burning, and, when this supply is withdrawn, ceases to burn; and, lastly, after being exposed for seven hours to flames of very great intensity, is not injured to a greater depth than about two inches from the original outer surface, and still shows a center as clean and fresh as when it was first put in. There may be other materials suitable for this purpose which are capable of resisting the effects of heat; and, if so, I hope we may one day hear of them; but, in the meanwhile, I venture to submit what I consider to be strong practical testimony in favor of massive timber for the internal supports of heavily loaded buildings."

THE SCOTCH IRON TRADE.

There is a rather firmer tone in the Scotch

iron markets just at present, warrants having recovered from 86/ to 88/. Makers' prices are somewhat irregular, but may be taken at the following: Gartsherrie, No. 1, 100/; No. 3, 93/; Coltness, No. 1, 102/6; No. 3, 92/; Summerlee, No 1, 97/6; No. 3, 90/; Carnbroe, No. 1, 97/; No. 3, 92/6; Monkland, No. 1, 92/; No. 3, 90/; Clyde, No. 1, 92/; No. 3, 90/; Govan, No. 1, 92/; No. 3, 90/; Langloan, No. 1, 100/; No. 3, 92/6; Calder, No. 1, 102/6; No. 3, 91/; Glengarnock, No. 1, 98/; No. 3, 92/; Eglinton, No. 1, 93/; No. 3, 91/; Dalmellington, No. 1, 94/; No. 3, 92/; Carron, No. 1, 102/6; Shotts, No. 1, 105/; No. 3, 97/6; Kinneil, No. 1, 97/6; No. 3, 92/6.

Shipments are increasing, and although the total last week, over 9000 tons, does not compare favorably with the corresponding week of 1873, I anticipate that the prevailing low prices will speedily bring the figures up to an equality, to say the least, with last year. The equalization, or nearly so, of prices, is having its natural effect of greatly diminishing the tonnage of pig iron, which has latterly been sent into Grangemouth (for Scotland) from Middlesboro' and other parts of the Cleveland district. The Scotch malleable iron trade is very weak, and the amount of new business is termed "excessively thin." Prices are, consequently, being put down £1 to £2 per ton.

CLEVELAND, BARROW AND OTHER DISTRICTS.

Quietude is still the order of the day in these young districts, albeit two or three firms, possessing exceptional advantages, are doing fairly well in steel rails. Bessemer pig is worth £6. 10/ to £7. 5/ at Barrow.

SHEFFIELD.

Some months back I mentioned that the directors of the Atlas Works, Sir John Brown & Co., Limited, had appointed a new general manager for the works. Mr. C. B. Holland, the retiring general manager, who has held the office for some years, has arranged to take the responsible management of the newly erected Sheffield Steel and Iron Works (Brown, Bayley & Dixon, Limited), and is about to enter upon his duties there. It is stated that the new manager at the Atlas Works is Mr. Stephen Berridge. The dispute with the hammermen and millmen at these works has, after a duration of about ten weeks, been brought to a satisfactory termination. The men originally resisted the notice given by the company of a reduction in wages equal to 10 per cent., but they have now resumed work at 5 per cent. lower on the condition—to which their employers have assented—that by a rearrangement of the mode of working the ingots, &c., through the hammers and rolls, their pay will remain about the same as it was prior to the strike. When the dispute began there were from 1600 to 1800 men affected thereby, but by removals to other towns, secessions, partial concessions, &c., the number has dwindled down to about 500. In the course of a somewhat cursory visit to several of the largest iron and steel works of the town this morning, I observed more activity than has been noticeable of late. Both the Atlas and Cyclops appear fairly busy in most departments, save the rail mills, and are turning out a large tonnage of Bessemer material. Messrs. Bessemer are also producing the same material largely. The boiler plate mills are moderately active, and at the boiler manufactories a good stroke of business is being done. For large steel marine shafts for propellers, cranks, piston-rods, and other large articles, there is a fairly good inquiry; indeed, one or two firms are turning out all they are able to produce. I heard of a case the other day in which a large crank shaft cast, as was believed most successfully, in fine steel, was rejected, owing to the discovery of a flaw while in the lathe. In the rough it weighed over 17 tons, and some three or three and a half tons of "chips and shavings" had been pared off before the disappointing flaw was found out. Most of the steel works are being run on short time to the extent alluded to in one or two previous communications. A few of them are doing rather better, an influx of orders having been secured by a drop in prices. Several descriptions of steel, mostly of the class known as "ordinary cast," have been lowered £2 to £4 per ton. Some firms have also put down Bessemer steel to a slight extent, but the information at present at my disposal does not lead me to believe that the deflection has in all cases been resorted to. The Sheffield Steel and Iron Works, at Attercliffe, are, I understand, turning out a fair tonnage of Bessemer material as ingots, and in the form of rails, axles and tires. At Penistone, Parkgate, Normantown and Dronfield works are employed on the same articles.

A dispute is thought to be imminent in the Sheffield ordinary steel trade, owing to the fact that the melters in the employ of Messrs. Wm. Jessop & Son, Brightside, have resumed making a third heat on the Saturday, for doing which they give a premium of nearly two shillings per man. The rules of the Steel Melters Union forbid this, and a meeting has been held at which the rebellious men were declared to have "the brand of Cain" upon them.

The iron works of the South Yorkshire district generally are doing a moderately good, but not very active, amount of business. Of finished iron, plates are in the best request. Foundry castings meet with a ready sale, especially the heavier description of goods.

In the Leeds and Barnsley localities the works are moderately busy, there being a fair demand for plates, sheets, ship plates, girders and machine tools.

Fuel is easier, as indeed it must be with the very large stock on hand in every direction. As an example of the "moderate profits" latterly realized by the ill-used colliery proprietors, it may be mentioned that at the annual meeting of the Masborough, Rotherham and Holmes Coal Company, on Friday last, a dividend of 80 per cent. was declared. There were several *interim* dividends during the year.

BIRMINGHAM AND SOUTH STAFFORDSHIRE.

The chain and trace makers of the Cradley Heath district have given notice for an advance in wages. If granted the prices of those goods would doubtless be augmented. Heavy washers are reduded 1/ per cwt., and light washers have an extra 2½ per cent. discount allowed. Iron tubes are also 2½ per cent. lower. Chains, cables and anchors have been reduced, stud cables by 1/ to 1/3 old B T test; ditto "proved as required by the new agent" 3d. lower, owing to increased cost of proving; best rigging chains are 1/3 to 2/ per cwt. cheaper; common anchors 6d. to 9d. per cwt. lower, better descriptions 3d. to 6d. per cwt. lower. The latch makers, on the other hand, have put up prices, owing to the workmen's demand for an increase of wages. Prices are easier for malleable castings, kitchen ironmongery, and some kinds of tubes. These remarks detail all the changes in price during the week—changes, you will observe, with one exception, all in one direction. Finished iron is unchanged. Sheet iron producers find they cannot do any business at the increase named in my last week's communication, consequently they have had to abandon the extra impost. Bars, plates and the like are precisely as when last alluded to, but signs are not wanting which seem to indicate an early fall, say, of £1 to £2 per ton. March has brought us the welcome finish of the Tichborne case—it *may* bring about a fall in finished iron.

SIX MONTHS' IRON EXPORTS.

Browne's export list—that useful statistical publication—gives the following comparative list, for the last six months, of the exports of pig iron, rails and merchant iron

PIG IRON.

Port.	1873. Aug.	1873. Sept.	1873. Oct.	1873. Nov.	1873. Dec.	1874. Jan.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
N'castle-on-Tyne.	1,259	2,489	1,953	829	784	1,272
Sunderland	885	692	35	158	321	750
Middlesborough..	28,870	24,325	29,146	24,989	19,138	8,009
Hartlepool	2,077	1,926	518	1,057	1,193	613
Hull	1,947	5,711	8,256	4,225	4,283	2,843
Goole	383	1,140	893	239	546	285
Liverpool	6,144	7,909	5,987	3,157	3,616	3,691
Whitehaven	150	....	900	1,027	1,020	750
Ardrossan	1,396	1,118	1,693	514	51	700
Grimsby	90	318	519	280	572	380
Cardiff	....	....	....	1	....	90
Borrowstoness	11	....	140	187	115	....
Greenock	255	1,495	500	110	50	725
Glasgow	10,476	12,546	4,943	5,510	9,850	6,000
Troon	110	....	....	....	225	100
Grangemouth	6,165	4,612	5,430	5,843	3,861	1,639
Port Glasgow	....	....	....	....	....	150
Ayr	....	....	90	....	....	....
Swansea	....	....	....	....	....	62
Stockton	580	280	....	143	400	810
Newport	....	1,560	....	....	....	....
South Shields	....	300	....	185	....	30

MERCHANT IRON.

Port.	1873. Aug.	1873. Sept.	1873. Oct.	1873. Nov.	1873. Dec.	1874. Jan.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
N'castle-on-Tyne.	2,830	2,005	2,717	2,183	1,365	874
Sunderland	500	149	105	199	57	90
Middlesborough..	225	1,170	309	408	316	7
Stockton	....	....	....	....	....	....
Hartlepool	41	1,185	294	496	598	129
Hull	3,977	5,015	6,628	5,282	2,104	778
Goole	48	3	....	24	....	2
Liverpool	7,974	11,388	10,634	8,177	8,732	8,143
Grimsby	55	183	130	208	84	55
Swansea	....	147	522	453	1,027	384
Cardiff	686	1,665	474	502	453	1,097
Glasgow	749	1,118	716	148	1,100	954
Greenock	57	....	....	....	....	....
Newport	....	660	....	....	....	....
Grangemouth	5	....	9	62	16	....
South Shields	3	....	....	....	8	....
Borrowstoness	....	....	....	....	....	....
Ardrossan	....	....	....	....	....	....
Port Glasgow	....	....	55	....	15	....

RAILS.

Port.	1873. Aug.	1873. Sept.	1873. Oct.	1873. Nov.	1873. Dec.	1874. Jan.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
N'castle-on-Tyne.	596	596	29	1	559	383
Sunderland	....	....	....	....	400	600
Middlesborough..	6,763	10,360	8,217	4,845	1,628	3,664
Hartlepool	7,074	2,300	4,857	2,705	5,085	2,100
Hull	3,560	1,982	1,901	2,800	1,336	56
Liverpool	5,790	7,468	6,571	8,558	7,416	4,804
Newport	18,297	13,062	14,198	....	7,342	4,848
Cardiff	14,668	16,279	12,982	12,590	8,240	8,132
Grimsby	16	476	1,190	13,137	281	660
Swansea	4,381	600	1,775	61	869	905
Goole	561	....	....	4,784	128	....
North Shields	....	....	....	....	....	397
Glasgow	....	....	....	....	....	895
Port Glasgow	....	....	....	....	....	270

METALS.

Metals are very quiet, and prices in many instances have retrogressed. *Copper*—Quotations for nearly all descriptions show a decline of about £4 per ton, the market at the close being very quiet, first hand sellers, as a rule, holding their stocks off the market. A fair quantity of bars have been sold at £76. 10/ to £77. 10/, cash, for ordinary brands, with small sales of special brands at an advance of £1 to £2 per ton on these prices. For the past few days sellers at £77, cash, have been scarce, and it is probable that very little will be done until the receipt of the Chili charters now due. In furnace material about 400 tons regulus here sold at 15/9, and, subsequently, 1500 tons here and at Swansea at 15/6 per unit. At the Swansea sale on 10th inst., 1776 tons ore, average produce 17 7-16 per cent., sold at an average of 14/9¾ per unit, the 31½ per cent. Cape ores realizing an average of 15/7½. *Tin*—This market has been very depressed, with prices continuously declining during the month. Quotations are now reduced to £99 for Straits; English common blocks and ingots, 107/; refined, 108/; Peruvian, 80/ to 90/, according to quality, but these prices are almost nominal, as buyers are scarce.

Messrs. Pitcairn, Campbell & Co. say, in their report:

"The downward course noted in our last has made further progress, and, though we close with more steadiness, an additional decline of 20/ to 30/ in Chili bars must be quoted. English copper is also very weak and prices irregular. Quotations are £77 to £77. 10/ for Urmeneta and Lota bars, up to £82 for other brands; 15/ to 15/6 for good ore and regulus, and 17/, nominally, for Corocoro Barilla. Business transacted during the fortnight comprises 1500 tons bars at £80 down to £76. 10/ per ton; 475 tons regulus here at 15/9, and 300 tons at 15/6 per unit. At Swansea 800 tons regulus at 15/6 per unit. *Tin*—We have to reduce our quotations £7 per ton on Straits, to £99 for spot, and £97 for arrival parcels. Peruvian is neglected at £85 to £90 per ton. English ingot is selling at £107 per ton. *Lead*—Market dull at £23 per ton for ordinary shipping brands. *Spelter*—Market quiet at £23 to £24 per ton for Silesian brands."

Messrs. Von Dadelzen & North's report states that in copper a moderate amount of business has been reported at a further decline in prices. Chili bars have been sold as low as £79. 10/, but the nearest value now is £77 to £77. 10/; £79 accepted for three months, prompt. Wallaroo has realized £88, at which there are still sellers. Burra quite nominal—£86 to £87. English remains unsettled, but in fair demand. Tin has undergone a serious decline, without, however, inspiring any confidence at the decreased price. Straits, which were quoted nominally £107 this day week, have given way to about £98, cash, and £97 for March delivery and afloat per steamer. Australian has declined to £97, cash, and £96. 10/ January shipment. Billiton and Banca in Holland are quite nominal, the former about 61fl., the latter about 63fl. English Tin has been reduced from £111 to £106 for common, but second-hand parcels are obtainable considerably below this price. Tin plates maintain their position, but some second-hand lots are offering at comparatively low prices. Lead remains still unsettled; good soft pig, £22. 5/ to £22. 15/. *Spelter*—Very little doing, at lower prices; some English reported yesterday at £23, and Silesian at £24—possibly at £23. 10/. Quicksilver has advanced to £20.

Titanium.

BY EDWARD J. HALLOCK, A. M.

Titanium is reckoned among the rare metals, not so much because it is seldom found in nature, as because it is seldom seen in the metallic state, and rarely occurs in large quantities. The mineral rutile is nearly pure titanic oxide, and contains about 61 per cent. of titanium. This mineral, however, possesses more theoretical than practical interest, for, though widely distributed, it occurs only in small quantities. It has been found in veins of quartz, feldspar and mica at Kingsbridge, N. Y., in gneiss at Barre, Mass., in various parts of Chester county, Pa,, and in nearly every other Eastern and Middle State. Rutile is a reddish-black mineral, with a metallic adamantine lustre, subconchoidal fracture, is hard enough to scratch glass, and is not easily scratched by the knife; it is insoluble in acids, and does not fuse before the blow pipe.

Titanium also occurs in many iron ores, and exerts an important influence on their properties. It is this fact that renders it not only interesting, but of great importance to practical men. Ilmenite, or titaniferous iron, is found at Krageroe, in Norway, in crystals weighing over 16 pounds. This ore contains 47 per cent. of titanic oxide. It is so infusible that for a long time it was impossible to work it, but modern metallurgists, having found a suitable flux, are now making an excellent quality of iron from it. Another species of titaniferous iron ore, found at Litchfield, Conn., contains 25 per cent. of titanic oxide. In its chemical relations it is intermediate between silicon and tin, but more closely resembles the former. It forms salts which correspond to silicates and fluosilicates. It also combines with nitrogen and cyanogen. Bright copper red crystals of nitro-prusside of titanium are found in the slag of blast furnaces where ores containing titanium are smelted.

PREPARATION OF METALLIC TITANIUM.

This metal may be prepared from rutile by first converting it into potassio-titanic-fluoride, 2 K F, Ti F_4. Wochler performs this part of the operation by fusing the very finely divided mineral in a platinum crucible with twice its weight of potassic carbonate, and dissolving the fused and pulverized mass in a platinum dish, in the requisite quantity of dilute hydrofluoric acid; the double fluoride partly crystallizes out. On adding water and boiling it redissolves and should be filtered hot. It is washed with cold water, and recrystallized from boiling water. It is now only necessary to heat this double fluoride with potassium in a covered crucible to set free the metal with vivid incandescence. The potassic fluoride is then washed out with water.

Metallic titanium has also been obtained by mixing titanic oxide with one-sixth its weight of charcoal and exposing to the strongest heat of an air furnace. Titanic oxide may be prepared from titaniferous iron ores in various ways. Clarke mixes one part of ore with acid, introduced to reduce the iron, and must afterward be expelled by heat not exceeding 113° F. After filtering, one-fifth to one-sixth its volume of acetic acid, sp. gr. 1·038, and one-third its volume dilute sulphuric acid (1 to 5) are added. After boiling eight or ten hours, pure white titanic acid is precipitated, free from iron.

Another method of preparing metallic titanium, which was employed at Birmingham as early as 1866, consists in reducing it with sodium. The powder thus obtained is then fused to a solid mass. It is easy to see that none of these methods will produce the metal cheaply enough in large quantities to enable us to use it in the arts. Here is certainly a field for inventive talent, for the material is plentiful enough, could it only be reduced at a small cost. At present its cost would be greater than that of silver.

Metallic titanium is said to bear a very striking resemblance to iron, with which it is so often associated, and from which it is separated with some difficulty. Pure titanium burns with great splendor when heated in the air, and, if sprinkled into a flame, is consumed with brilliant scintillations, at a considerable distance above the point of the flame. When heated to redness in oxygen gas it burns with a splendor resembling a discharge of electricity. Iron and steel possess these properties in a less marked degree. Titanium, when heated, burns brilliantly in chlorine gas. Mixed with red lead, and heated, it burns with such violence that the mass is thrown out of the vessel with loud detonation. It does not decompose water below 100° C.

TITANIUM IN STEEL.

The presence of titanium in an iron ore seems to improve the quality of the iron, and renders it of excellent quality both for castings and for conversion by the Bessemer process, although very little of the titanium seems to remain in the iron after it is converted into bar iron or steel. In 1859, Robert Mushet patented in England the use of titanium in the manufacture of cast steel. The patentee proposed to add to blistered steel enough titaniferous iron ore to give to every 40 pounds of steel from ¼ to 4 ounces of titanium, according to the hardness desired. Where titaniferous iron ores were not to be obtained, pulverized rutile, brookite, or other minerals containing titanium, were mixed with a carbonaceous material like tar or resin, which was fused in a kettle, thoroughly stirred and poured upon a stone to cool. From ¼ to 1 pound of this mass was added to every 40 pounds of steel, after which it was fused in a crucible and cast in molds. Mushet soon after took out two patents for the use of titanium in puddled and cast iron. In 1861 the same person took out another patent for the introduction of ilmenite into the blast furnace along with red hematite ores, in the proportions of 5 or 10 pounds of the former to 100 pounds of iron ore. A larger quantity of ilmenite renders the iron so infusible as to require an increase of fuel. The furnace should be run in such a way as to produce gray iron; if white iron is produced most of the titanium is oxidized and passes off with the slag.

The Late Christian Sharps.

The death of Christian Sharps, the inventor, is already known to most of our readers. He was born in New Jersey, and was sixty-three years and five months old. His inventive powers were certainly extraordinary, as his numerous inventions, many of them exhibiting a very singular and original capacity, most decisively attest. He removed to Hartford, if we remember aright, in the year 1854, about the time of the establishment there of the Sharps' rifle factory. He supervised for a time some of the processes of the work in the production of that world-famous weapon. Mr. Sharps was the inventor of a number of other arms, all exhibiting the amazing fertility of his resources as an inventor, and he had also invented a number of ingenious contrivances for the promotion of other objects than those of war, for he was emphatically a man of peace. One of his latest subjects of care and pleasure was an establishment in Vernon, for the artificial breeding of trout.

Christian Sharps, like most inventors, never derived from his inventions, the pecuniary share to which he was justly entitled. A man of extraordinary intelligence in nearly all things, he was yet not exactly what is called a 'practical man." Personally he was one of the kindest-hearted of men. He was a very decided spiritualist, and had not the slightest fear of death. His health had for years suffered in consequence of a bronchial difficulty, which had the past winter begun to affect the top of his lungs. Yet he did not anticipate so sudden a termination; in fact he had strong hopes of restoring his health by a residence in Florida, for he had, he said, one or two inventions yet to bring out, which would be more notable than any he had produced.

Cheap Power.

The Titusville, Pa., *Herald* says: There have been many inventions and contrivances for pumping small producing wells, and the utmost skill and ingenuity has been displayed in the application of cheap motive power to that purpose.

One of the most remarkable instances on record, however, has recently been brought to our notice where a producer has utilized the waste water in one well to pump the oil out of another. This feat to most ordinary minds would at first blush seem absurd and analagous to perpetual motion, but a brief description of the simple method by which it is accomplished will convince even the most skeptical as to its practicability.

The well in question is the Logan & Emery well on the John Watson farm, at the eastern extremity of our city. It is owned by S. P. Logan, a gentleman of indefatigable energy and unbounded ingenuity. It is a small well, and will only yield, under the most advantageous circumstances, four to five barrels of oil per day. The cost of fuel and labor to run such a well, in the ordinary manner, would be considerably in excess of what its product would bring at present prices, and most proprietors would have "shuter-down." Not so with Mr. Logan. He had another well about thirty rods distant on the hillside and about forty feet elevation above the flats. This well failed to yield much oil, but persistently yielded gas and water instead. A brilliant idea struck Mr. Logan. He thought that if the water rose in that hole fast enough he might syphon it out and utilize the flow to run an over-shot water wheel powerful enough to pump his well. He experimented and found the water 16 feet beneath the surface, and after repeated trial failed to reduce the quantity, as the water rose up in the hole as fast as it could be pumped out. He then dug a trench in the hill-side, about 44 feet deep, to the edge of the hole, which brought him within two feet of the water, and he inserted a 2-inch pipe in the form of a syphon, with its long leg projecting down to his well on the flats below. After the air was exhausted, the water commenced to flow and continued to flow in a perpetual stream, the full size of the pipe. Elated with success he built a 12-foot over-shot water wheel, with buckets one foot wide, and rigged it to the walking beam of his pumping well. When the water was turned on the top of this wheel the well commenced pumping at the rate of twenty-four barrels per day, twenty of which was water and four oil. Here is a motor successfully applied, as perpetual as the hills themselves, and which is equivalent to a flowing well. The idea is most ingenious and practicable in hundreds of localities throughout this upper district, and it may yet be the means of greatly adding to the wealth of the region.

Improvement in Drilling Machines.

Drilling, boring and reaming holes that are close together, many at once, has been thought quite impossible, but we have seen a machine working which drilled at one time some 200 holes only ⅜ in. apart, and we were struck by the simplicity of the invention, and its practicability for use in either wood or metal. Its use is illimitable, as the bits or drills can be arranged to bore or drill any combination of holes, and it can be applied and used for drilling any number of holes at once, from a boiler head to a tooth brush. The owner of the patents wants to sell out the rights for the United States and Europe, one or both, or associate with him parties who can and will develop the different uses to which the invention can be applied, such as reaming hinges, drilling boiler plates, cane seat chairs, etc., as power on the drills or bits by this invention can be gained, however much is needed, without limit; there is no drilling, boring or reaming which cannot be done by hundreds of holes at once. An advertisement of this invention will be found on the 3d page.

Magnetic Iron Sand as a Cause of Shipwreck.

The New Zealand *Gazette* says: An inquiry into the wreck of the Ottawa, on the Taranaki coast, tends to confirm the belief, long since entertained, that the magnetic iron sand, which there abounds in such immense quantities, is the cause of the steering compasses of ships and steamers running along shore becoming deranged. This was alleged as the cause of the loss of the steamer Airedale, and some three or four other vessels, which were stranded previous to that casualty happening. If it be the case that vessels are endangered by the deflection of the compass, a commission of nautical men should be appointed to ascertain the amount of variation they are subjected to at different distances from the beach line, and at the different places along the coast, where vessels are accustomed to sail or steam. Some fifteen years ago many vessels were cast ashore on the South American coast, and the cause for those wrecks long remained a mystery. After many close investigations, it was discovered that the base of some of the mountains along the coast line contained large quantities of iron ore. A naval commission was held, experiments were made, and the precise variation of the compass was ascertained at various points, and at different distances from the shore. These were laid down in the charts, and subsequent wrecks on the coast were occurrences of great rarity. The propriety of ascertaining whether our coasting vessels and steamers are endangered by the iron sand of the Taranaki coast cannot be doubted.

Wages in Massachusetts.—The Boston *Advertiser* makes the annexed remarks upon the report of the State Bureau of Statistics: The average of wages seems to be, on the whole, about 75 per cent. higher in Massachusetts than in England, while the actual cost of living is about 30 per cent. higher here. These are but general estimates of our own, and of course they are subject to wide variation, but they are, to a great extent, supported by the evidence that the wage class manage to save a great deal of money in the aggregate. Here the savings banks' returns become of much value. The returns from 104 savings banks in this State show that during the last four months of 1873 there were upward of 14,000 deposits by persons dependent upon their daily labor, amounting in all to $1,733,503. This was almost 45 per cent. of the aggregate deposits in all these banks during that period, and yet the classification was so strict that clerks, salesmen and women, porters, overseers, foremen, milkmen, and all minors and women, whose occupation was not known, were excluded from the wage class. Taking the year through, the record of 21 banks, which made returns, shows that 38 per cent. of the deposits were by the wage class alone. This table of hours of labor, however, shows that the time required from laborers in Massachusetts is almost invariably greater than in England, and is usually greater than on the Continent, though to this there are numerous exceptions. As for the increase of wages, there is most instructive testimony in the shape of a statement of the prices paid by the hour and by the week in 1861 and in 1873 by two of the great mills of Lawrence. It appears that in the Pacific Mills the increase of wages by the week—two and a half hours a week less being required in 1873 than in 1871—has ranged from 20·8 per cent. to 99·5 per cent. There was but one class of workmen, however, whose wages have been increased less than 40 per cent. The average increase of men's wages was 54·6 and of women's 74·3 per cent. In the Washington Mills the increase ranged from 43·4 to 101·3 per cent.; the average increase for men being 62·7 and for women 78 per cent. This is notoriously greater than the increase in the cost of living, and shows conclusively that the condition of the working classes has improved. Yet the statement of wages paid shows how difficult it must still be for men and women to live with any degree of comfort on their earnings

The Iron Trade of Germany.—We take the following, which throws some light upon the present state of the iron trade and the railway interest in Germany, from the Berlin *Borsen Zeitung:* All reports agree upon the bad state of the iron trade, though they may differ as to the causes by which it is to be accounted for. Those in the trade who suffer most directly believe that the reason is to be found almost exclusively in the high price of coal, compared with the low prices of iron. Though, however, the disproportion between two such essential and mutual dependendt branches of industry cannot be denied; and though it must be admitted that the rise in the price of coal, contracted to be delivered in 1874, had an effect all the more disadvantageous, as at the time of this advance the downward movement in the price of iron (produced by reduction of duties and the general state of affairs) had already commenced, still we believe that the high price of coal is not the only nor the principal cause of the calamity from which the iron industry is suffering at present. The fault is attributable in a far higher degree to the railways, and their keeping back of even the more necessary orders.

It sometimes happens that by centering, &c., the interior diameter of a tire becomes so much too large that it will not fit the wheel. Such defects have been corrected for a long time by J. Fiedler, a German machinist, by heating the tire red hot, and holding in that condition half immersed in cold water until cold, then heating again red hot and immersing the other half in the same way. In the first operation the unimmersed hot portion must contract with the portion rapidly cooled, with a corresponding condensation of material, and consequent permanent diminution of diameter, and in the second operation a similar effect is produced on the other half. By these two operations an interior diameter of 34 inches can be reduced ¼ an inch. and by four operations ½ inch. The method given is not confined to tires, an instance being given where a ring of Bessemer steel, to be used as a flange ring, had been entirely misshaped by an unexperienced workman, and was drawn into shape by heating 15 times, and cooling different portions.

The Durham (Eng.) coal field owners have reduced the price of house coal three and four shillings a ton, and manufacturing coal and coke are also lower. North of England advices the last of February mentioned a general derangement of prices, indicating a further general fall, both in the iron and coal trades, and the trade in South Wales showed greater depression, instead of the long expected improvement. The Birmingham coal and iron markets were very much unsettled. It was said that the "demand on the United States account is somewhat steadier, but the business done with that market this quarter will be considerably under the average."

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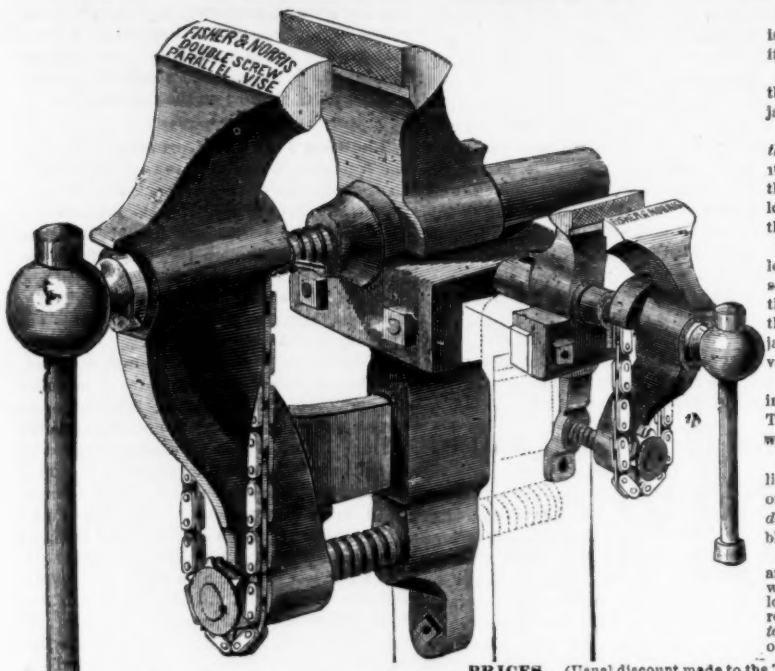

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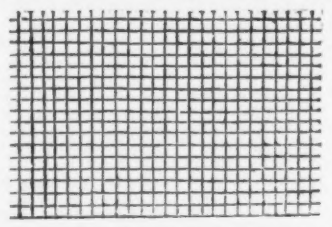

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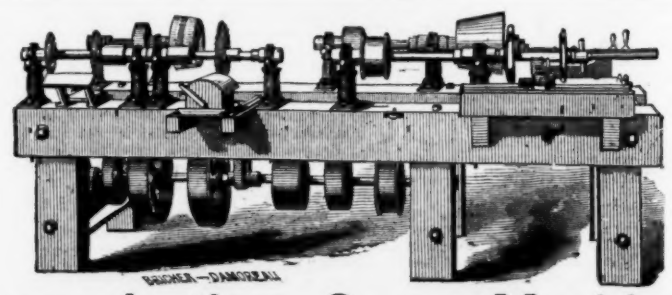

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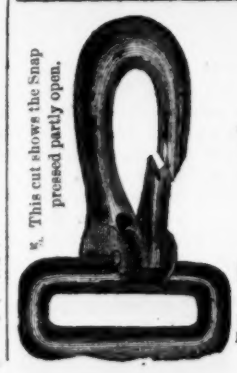

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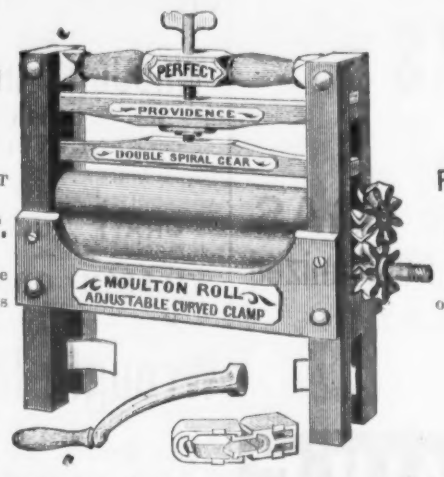

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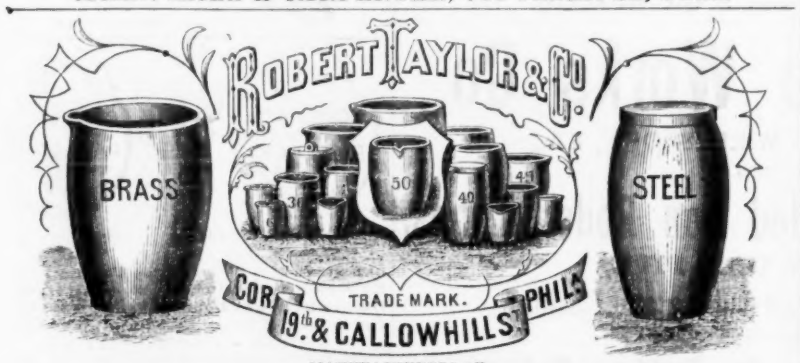

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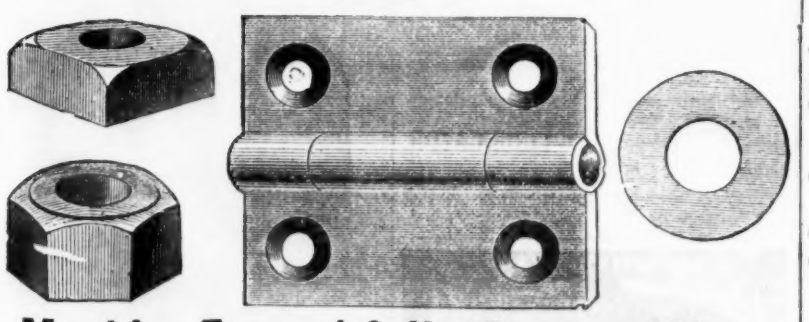

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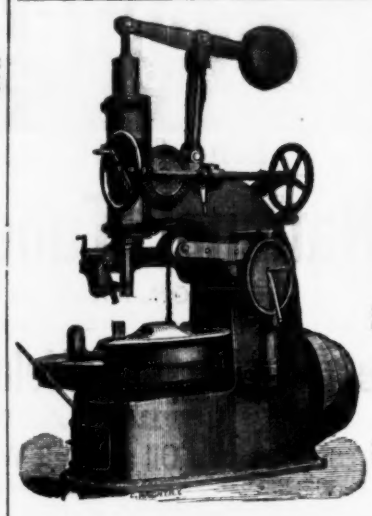

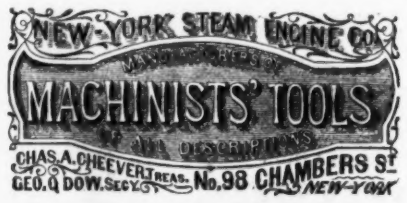

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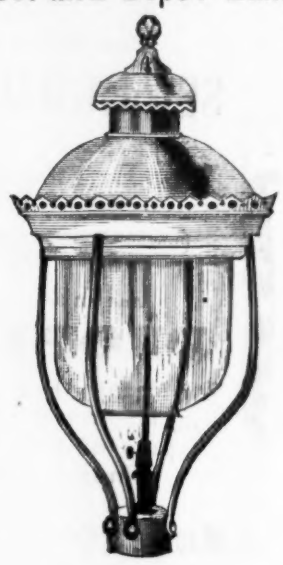

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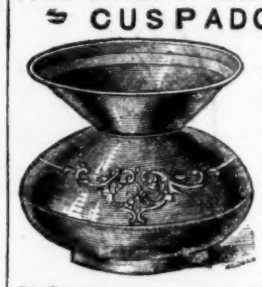

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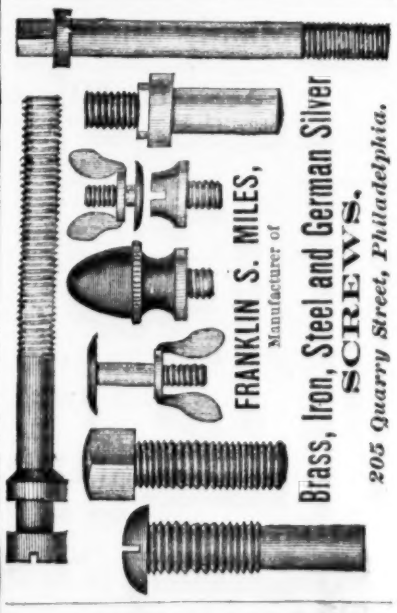

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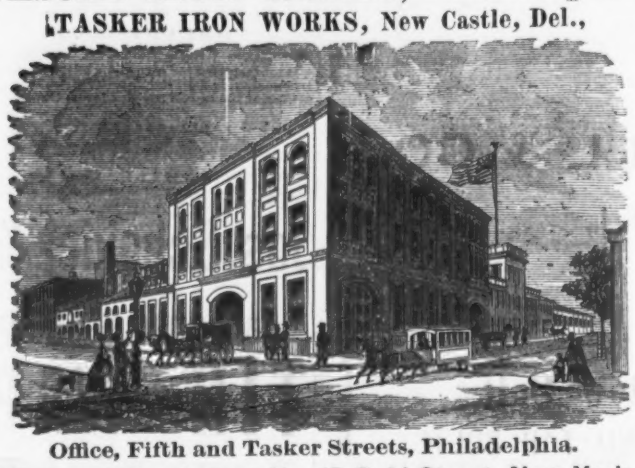

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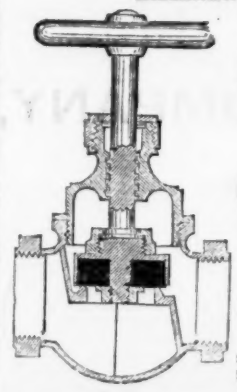

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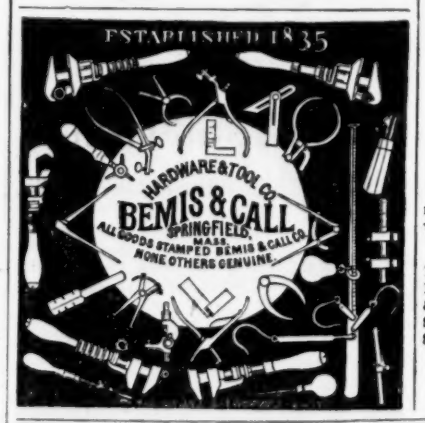

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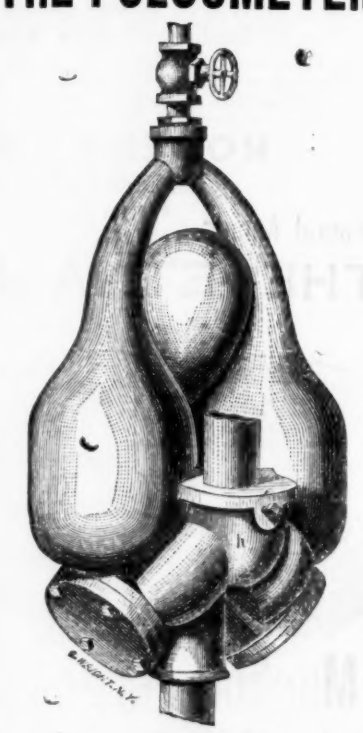

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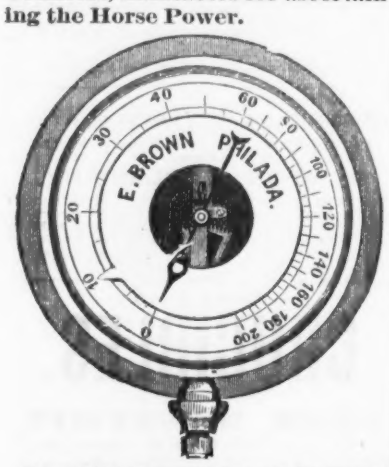

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Circulars on application.

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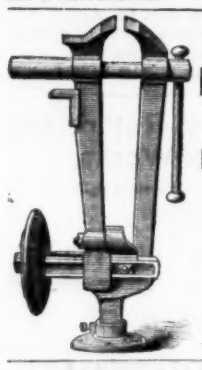
BAND SAW MACHINES.

For Bevel and Square Scroll Work and Re-sawing. Manufacture six different sizes. Prices, $165, $210, $270, $290, $350, $425, and $1000. Also manufacture CARVING, SHAPING, FLUTING, ADJUSTABLE DOUBLE SPINDLE BORING, CARVED and SERPENTINE MOLDING MACHINES. Also, GENERAL and COUNTER-BALANCED OVAL TURNING LATHES for WOOD and BRASS TURNING, METAL SPINNING, etc.

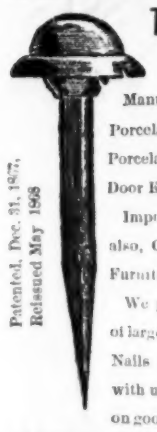
CIRCULAR SAW BENCHES, SHAFTING PULLEYS, and HANGERS.

A large assortment of the best FRENCH BAND SAW BLADES, at greatly reduced prices. And a Machine that will set an ordinary Band Saw PERFECT in two and a half to three minutes.



Patent Parallel
Machinist's Vise
Manufactured by
Harrisburg Foundry and Machine Company.
Harrisburg, Pa.

☞ *Send for Circular and Price List.*



Patented, Dec. 31, 1872, Reissued May 1878

T. C. RICHARDS & CO.,
47 Murray Street, N. Y.,

Manufacturers of Richards' Patent Porcelain-head Picture Nails; also, Porcelain Picture, Drawer, Shutter, and Door Knobs, etc., etc.

Importers of German Brass Goods, also, China, Gilt, Steel, and Silvere Furniture Nails Wire Nails etc., etc.

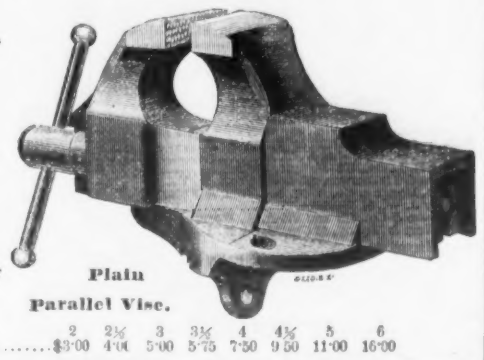
We particularly invite the attention of large buyers to our Patent Picture Nails and Knobs being a specialty with us, we offer satisfactory discounts on good orders

---

WILLIAMS WHITE & CHURCHILL,
Successors to
MACKRELL & RICHARDSON MFG. COMPANY,
Manufacturers of
Builders' Hardware,
Locks, Hinges, Hooks and Staples,
Awning Hooks, Meat Hooks, Pincers,
Champion Noiseless Pulleys,
CHAIN PULLEYS, &c.
Factory, cor. Flushing and Nostrand Avenues BROOKLYN.
Warehouse, 73 Warren St., N. Y.

Trenton Vise & Tool Works,
TRENTON, N. J.

Hermann Boker & Co.
101 & 103 Duane St.,
NEW YORK,
Proprietors.



Simple in their movement, exact in their make, and reasonable in price.

Plain Parallel Vise.

	2	2½	3	3½	4	4½	5	6
List.....	$3·00	4·00	5·00	5·75	7·50	9·50	11·00	16·00

R. M. GREEN & CO.,
100 Chambers Street, NEW YORK.
Hardware Manufacturers' Agent.
REPRESENT:

BATCHELLER MFG. CO., Cast Steel Forks, Rakes, &c.
VERMONT SNATH CO., Snaths.
NORTH CAROLINA HANDLE CO., Axe and Pick Handles.
EXCELSIOR MFG. CO., Carriage Rims, Hubs and Spokes. Wood Hay Rakes.
VERMONT MFG. CO., Hay, Manure and Shovel Handles. All kinds of Ash, and Hickory Timber Sawed and Turned to order.
BIGSALL MFG. CO., Barn Door Rollers and Hangers. G. S. Fixtures, Pump, &c.

Ausable Horse Nail Co.,
MANUFACTURERS OF
Hammered and Hammer Pointed and Finished
HORSE NAILS,
FROM
BEST NORWAY IRON.
Orders promptly filled at lowest market rates.
ABRAHAM BUSSING, Secretary.
35 Chambers Street, New York.

GLOBE NAIL COMPANY,
MANUFACTURERS OF
Pointed, Polished & Finished Horse Shoe Nails.
Recommended by over 20,000 Horse Shoers.

All Nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

GLOBE NAIL CO., Boston, Mass.

C. HAMMOND & SON,
Mfrs. of Hammers, Edge Tools, Railroad, Machinists' & Blacksmiths' Tools,
Office and Sample Rooms, 13 N. 5th Street, PHILADELPHIA.

Unfinished Picks..... $8 00 per doz
Finished Picks..... 10 per doz
Pittsburgh Broad Axes..... 20·00 per doz

NELSON TOOL WORKS,
Trade Mark, H. NELSON. 157 East 32d Street, N. Y., Trade Mark, H. NELSON.

MANUFACTURERS OF

Mining & Paving Tools,
H. Nelson's Solid Eyed Pick,
Kip Hammers,
Stone Breakers,
Masons' Peen & Scabbling Hammers,
Hand or Mash Hammers,
Chipping Hammers,
Flaggers' Hammers,
Shackel Bars,
Block Stone Sledges,
Mauls,
Sledges,
Blacksmiths' Sledges,
Masons' Brick Hammers,
Swedges, all sizes,
Mill Picks, Crow Bars,
Smiths' Hand Hammers,
Coopers' Hammers,
Masons' Stone Axes,
File Cutters' Hammers,
Striking Hammers,
Fullers, all sizes,
Horse Shoers' Tools,
Rail Tongues.

HAMMERS of all kinds made to order, on receipt of Pattern or Drawing. Special attention paid to R. R. Work

---

EMMET HAMMER CO.,
Manufacturers of all kinds of
HAMMERS AND SLEDGES AND CONTRACTORS TOOLS,
BROOKLYN, E. D., NEW YORK.

GREENFIELD TOOL CO.,
Sole Manufacturers of the Celebrated
"Diamond" Plane Irons,
Of **Uniform** temper and finish. Solid **Steel Caps and Warranted.**

Patent Forged Ox Shoes.

The **only** Shoe made with **concavity** to fit hoof, and the best and **cheapest.**

Bench & Moulding Planes

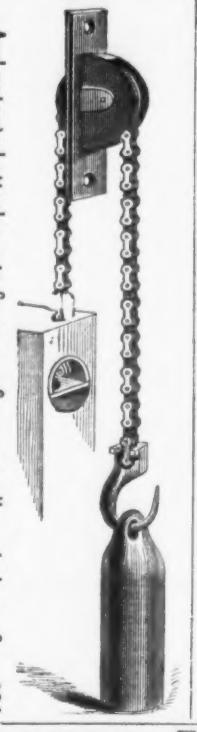
of every description. Also, Plow and Match Bitts, Moulding and Rabbet Irons, Plane Stops, Cutts, Starts, Plates, &c., &c. Drop Forgings to order. Address for Catalogue and Prices

Greenfield Tool Co., Greenfield, Mass.

Warehouses: **New York, 37 Chambers St. Boston, 22 Oliver St.**

☞ Reduced Prices for 1874.

THOMAS MORTON,
Manufacturer of
Brass & Copper Chain,



And patented attachments for same, for suspending windows, from 100 to 1500 lbs. Sashes can be suspended with my Chain and attachments in a shorter time and with less trouble than by using the ordinary common cord. I am now offering the Chain and fastenings cheaper than any other in the market. Also manufacturer of the MORTON & BREMNER'S Straight and Circular Spring Balances. Established in 1842.

Office, No. 15 Murray St., N. Y.

Many & Marshall,
48 Warren St., N. Y.
SASH CHAIN.
THE BEST & CHEAPEST MADE.
Manufacturers of every description of
BUILDERS' HARDWARE,
Pure Bronzed Metal and Hand-Plated Knobs, Hinges, &c.,
Agents for Gauntlet's Black Lead Crucibles.
Agency and Depot of the TRENTON LOCK COMPANY.

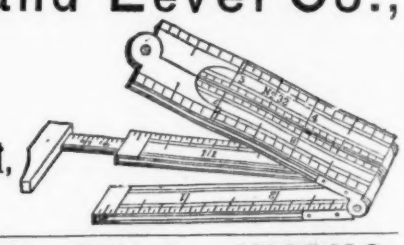
Chain and Pulley for Heavy Sash

GRANT'S LIGHTNING SCREW PLATE

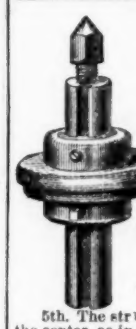
The most perfect Labor Saving Tool ever invented for its purposes. Warranted to do five times the work possible with any other screw plate. Also *HAND BOLT CUTTING MACHINES,* ranging in price from $60 to $200. *POWER BOLT CUTTERS,* from $175 to $350.

FINE FRICTION CLUTCHES.
WILEY & RUSSELL, Greenfield, Mass.

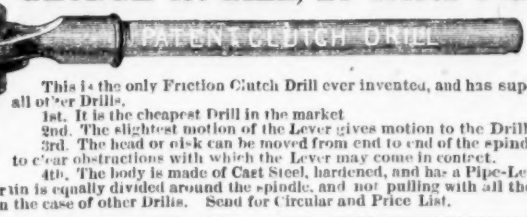
Stanley Rule and Level Co.,
WAREROOMS,
REMOVED TO
No. 35 Chambers Street,
NEW YORK.



NEW YORK SCREW BOLT WORKS.
(Estate of R. J. DEWHURST, deceased.)
JOHN COCHRANE, Executive Agent and Manager,
Office and Works, cor. Ave. D and 11th St., N. Y.
Bolts, Nuts, Turnbuckles, Washers, Forgings, &c
The attention of large consumers solicited.



"GILL'S" CAST STEEL PATENT
CLUTCH DRILL,
GEORGE W. GILL, 27 North 5th St., Phila.

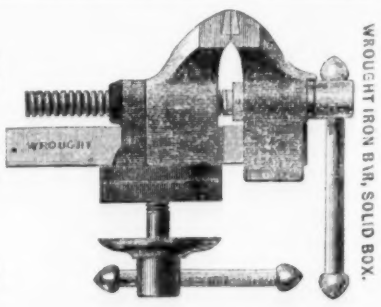


This is the only Friction Clutch Drill ever invented, and has superior advantages over all other Drills.
1st. It is the cheapest Drill in the market.
2nd. The slightest motion of the Lever gives motion to the Drill.
3rd. The head or disk can be moved from end to end of the spindle, thereby being able to clear obstructions with which the Lever may come in contact.
4th. The body is made of Cast Steel, hardened, and has a Pipe-Lever screwed in same.
5th. The strain is equally divided around the spindle, and not pulling with all the strain on one side of the center, as in the case of other Drills. Send for Circular and Price List.

PARALLEL SWIVEL VISE.

This Vise, on account of its weight, and material used in its construction, is the **Strongest, Best,** and, all things considered, the **Cheapest Vise** in the market. Please notice the size of the bar below the screw, which is **Wrought Iron,** making it almost impossible to break.

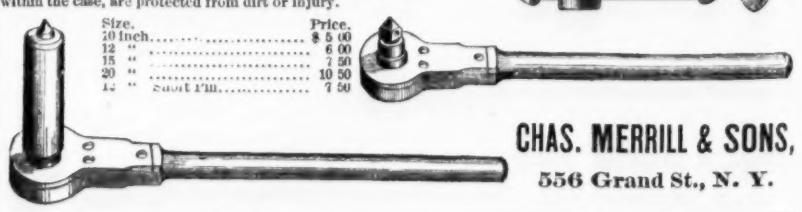
Width of Jaw.	Opens.	Weight.	Size of Wr'ht. Bar.	Diam. of Screw.	Price.
4 in.	8 in.	50 lbs.	2¼ x 1¼	1¼ in.	$11 00
5 in.	9 in.	80 lbs.	2½ x 1¼	1¾ in.	13 00
6½ in.	10 in.	130 lbs.	2½ x 1½	1⅞ in.	17 50
8 in.	12 in.	167 lbs.	2¾ x 1½	1⅞ in.	22 00



RATCHET DRILL.
(Patented Aug. 11, 1863.)

The Drill Socket and Feed Screw are case-hardened. The working parts are simple, durable, easily renewed, and being within the case, are protected from dirt or injury.

Size.	Price.
10 inch.....	$ 5 00
12 "	6 00
15 "	7 50
20 "	10 50
12 " Short Pin.....	7 50



CHAS. MERRILL & SONS,
556 Grand St., N. Y.

FOR THE BEST
FRAMING CHISELS,
Apply to
Ohio Tool Co., Columbus, Ohio.
J. Clark Wilson & Co.,
Agents, 81 Beekman St., N. Y

Alexander Brothers,
Manufacturers of **OAK TANNED**
LeatherBelting
410 & 412 North 3d, Philadelphia, Pa.

Keystone Saw, Tool, Steel and File Works,

PHILADELPHIA.

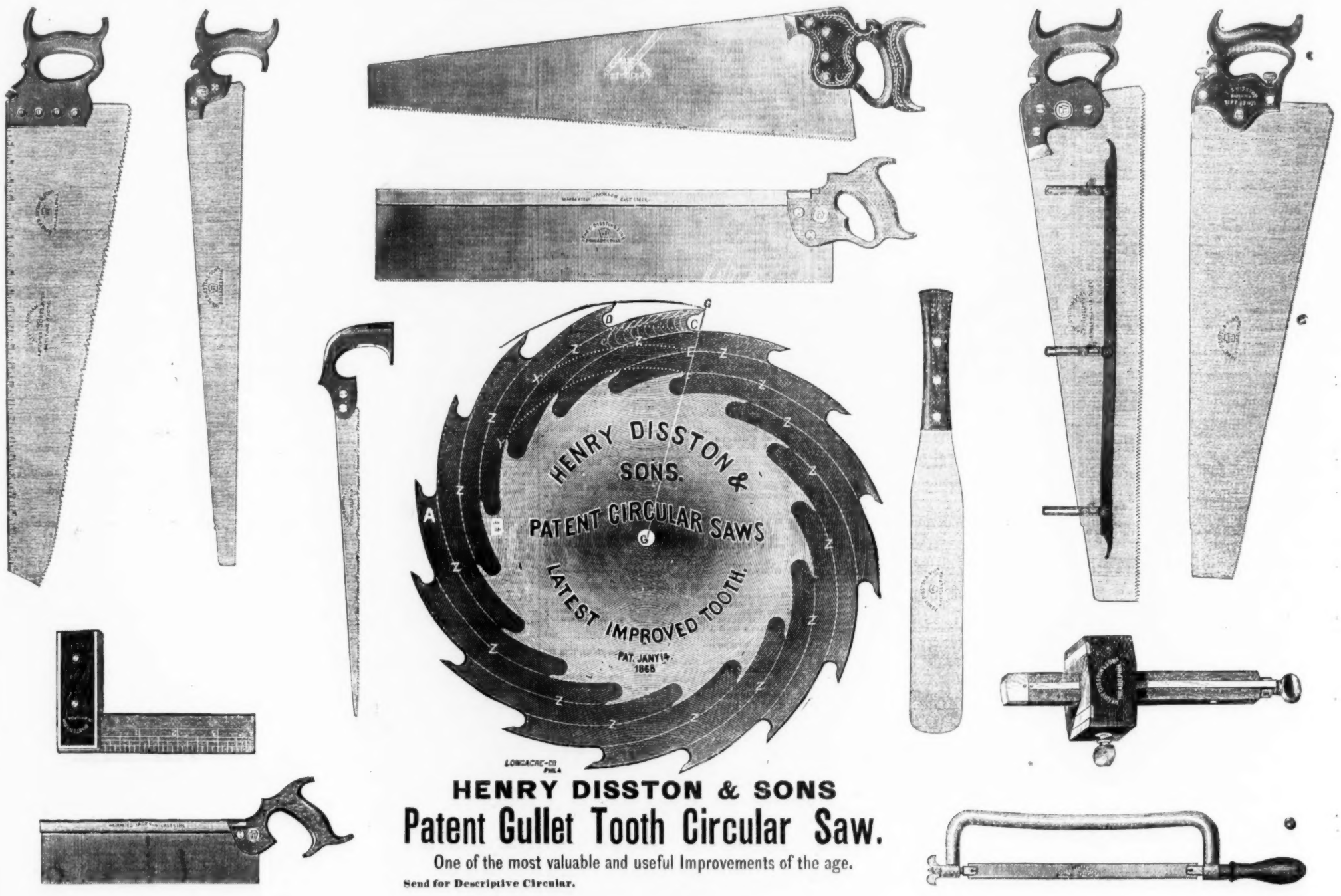
HENRY DISSTON & SONS,

MANUFACTURERS OF

Warranted Cast Steel Patent Ground and Tempered Circular Mill, Mulay, Cross-Cut, Pit and Drag Saws.

Also Hand, Panel, Rip and Back Saws, Band Saws, Butcher Saws,

Compass and Pruning Saws, Segment, Shingle and Concave Saws, Saw Mandrels, Files, and all kinds of Labor Saving Tools for keeping Saws in Perfect Order. Also Manufacturers of Sheet Steel and all articles made from Sheet Steel.

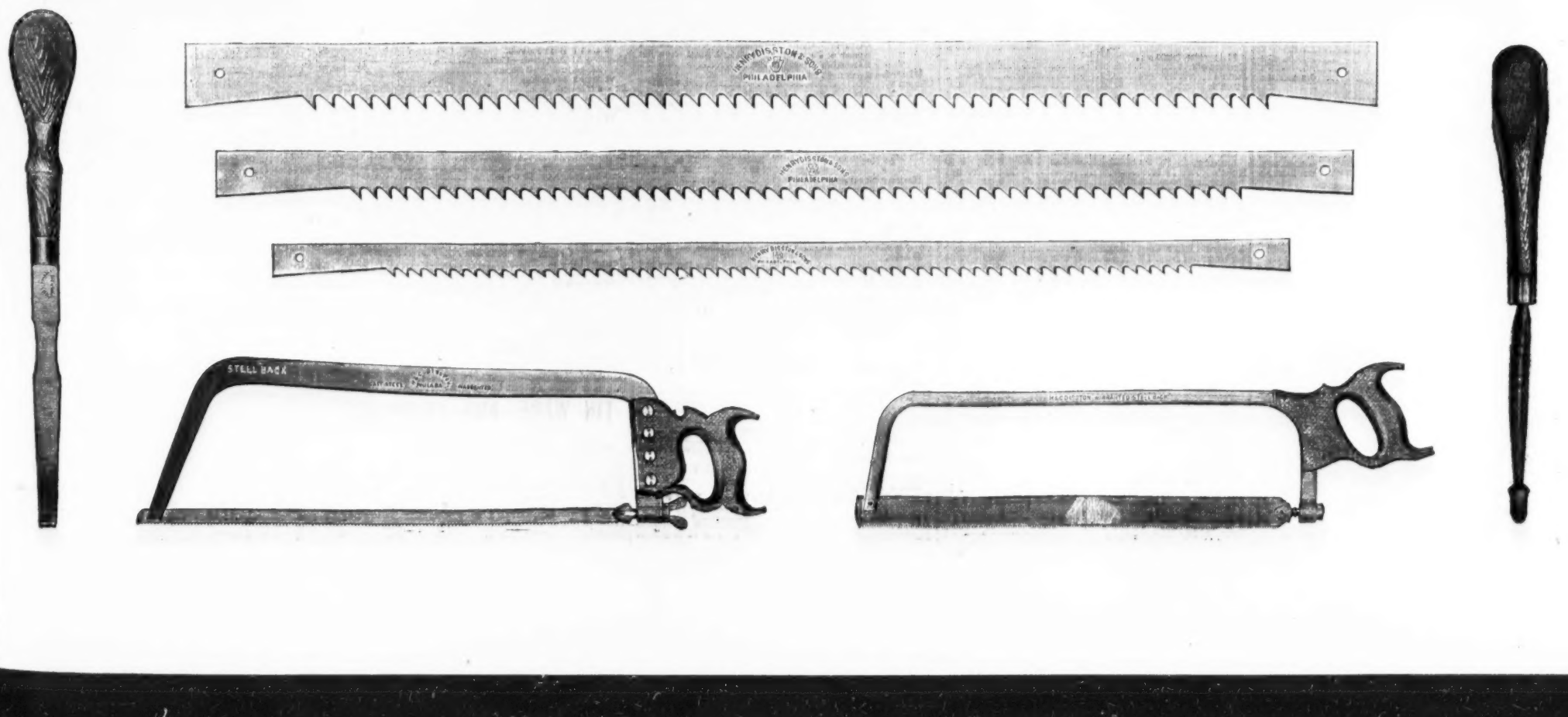


HENRY DISSTON & SONS

Patent Gullet Tooth Circular Saw.

One of the most valuable and useful Improvements of the age.

Send for Descriptive Circular.



New York Wholesale Prices, March 18, 1874.

HARDWARE.

Anvils.
Solid Cast Steel ... ℘ lb 14c
Wright's ... ℘ lb gold 13c; over 250 lbs 12½c, gold
Armitage's Mouse Hole ... gold 11c
Wilkinson's ... ℘ lb gold 11½c
Eagle Anvils, ℘ lb 11c currency ... dis 15 @ 15&5 %

Apple Parers.
Turn Table, Lightning, Conqueror ... $8·50 ℘ doz
Reading ... ℘ doz 8 00
Union ... ℘ doz 9 00
Bay State, Paring, Coring and Slicing ... 15 00 } dis 5 %
Skeleton " " " ... 9 00
Climax Slicer ... 9 00
Bay State Peach Parer ... $11 00 @ 11 50
Lightning " " ... 11 00 @ 11 50
Peach Stoner and Halver ... 7 00

Augers and Bits.
Snell Mfg. Co. ... dis 15 @ 20 %
Russell Jennings ... dis 10 %
Douglass Mfg. Co., Extra ...
" " No. 1 ...
" " Hollow Augers ...
Cushman's Expanding Hollow Augers ... dis 20 %
Ives' Augers and Bits ... dis 30&10 %
" Gouge Lip Augers and Bits ... dis 30&10 %
" Hollow Augers ... dis 30&10 %
" Expansive Hollow Augers ... dis 30&10 %
" Expansive Bits ... dis 20&10 %
Andrews' Bits ... dis 25 %
Clark's Expansive Bits ... dis 15 %
Cook's Patent Augers ... dis 50 %
" " Bits ... dis 40 %
Shepardson's Double Cut Bits ... dis 20 %
Griswold's Patent ... dis 20 %
Cast Steel Cut Augers ... dis 30&10 %
" Auger Bits ... dis 30&10 %
Long Augers ... new list dis 30 %
Bonney's Patent Hollow ... $48 per doz—dis 25 %
Stearns' " ... $48 per doz—dis 25 %
Morse's Bit Stock Drills ... dis 20 %
Nobles Mfg. Co. C. S. Cut Augers ... dis 30&10 %
Watrous Ship Augers ... dis 10 %

Axes.
Blood's ... $12 50 @ 14 00
Hunt's ... ℘ doz $15 00 @ 17 50 net @ dis 5 %
Collins' ... ℘ doz 11 00 @ 16 00 net @ dis 5 %
Hurd's ... ℘ doz 12 50 @ 13 50
Schweitzer Mfg. Co.'s ... ℘ doz 13 00 @ 15 00
Simmons' ... ℘ doz 12 50 @ 14 00
Morris' ... ℘ doz 12 50 @ 13 50
Red Jacket ... ℘ doz 12 00 @ 12 50
Mann's ... ℘ doz 12 50 @ 13 00
Double Bitted ... ℘ doz 21 50 @ 22 00
Powell Tool Co., "Peerless" ... ℘ doz 13 00 @ 14 50
Underhill's ... ℘ doz 12 50 @ 13 50
" Crown ... ℘ doz 13 00 @ 14 00
John Leverett's ... ℘ doz 12 50 @ 15 50
Nobles Mfg. Co. S. B. ... ℘ doz 12 50 @ 13 00
" D. B. ... ℘ doz 22 00 @ 23 00

Balances.
Chatillon's, Frary's, Morton's ... new list dis 15 %

Bands.
Plated ... new list dis 50&5 %
Iron Rim ... new list dis 15&5 %
Brass (Plated list) ... new list dis 50, 10&5 %
Oroide ... new list dis 50&5 %

Bells.
Hand, Light Brass ... dis 60&10 @ 65&10 %
White Metal ... dis 45&10 %
Globe ... dis 15&10 %
Aobe's ... dis 10&10 %
Taylor's Patent Door ... net
Western Gong ... net
Brook's Crank ... dis 10 %
" Pull ... dis 15&10 %
Hart Mfg. Co., Crank and Pull ... dis 50&10 %
Cow—Common Wrought ... dis 20&10 %
Western ... new list dis 20&10 %
Kentucky "Star" ... new list dis 20&10 %
Dodge's Genuine Kentucky ... new list dis 25 %
Yaw's Genuine ... dis 20 %
Call ... dis 15 %

Bellows.
Blacksmiths' ... dis 15 %
Moulders' ... dis 15 %
Hand Bellows ... dis 10 %

Blind Fasteners.
Van Sand's ... ℘ gross $14 00
Washburn's Patent ... ℘ gross 14 00
Merriman's ...

Blind Staples.
Boardman's Patent, ½ in. and larger ... ℘ lb 37 c
" ⅜ in ... " 42 c

Bolts.
Carriage and Tire, Ætna Nut Co. ... dis 60 %
Stove, Ætna Nut Co. ... dis 10&5 %
Cast Iron Barrel, Shutter, &c. ... old list dis 35&10 %
Wrought Iron Barrel ... new list dis 50&10 %
" " Square ... new list dis 50&10 %
Wrought Iron Flush ... dis 15 %
Carriage and Tire, Common ... dis 70&10 %
" " Norway Iron ... 60&10 %
Star, Philadelphia ... dis 50 @ 50&10 %
Eagle, Philadelphia ... dis 50 @ 50&10 %
Skelly's Phila. Norway Iron Finished Points ... dis 50&5 %
Philadelphia Pattern, P. S. & W. ... dis 50&10 %
Carriage and Tire, R. B. & W. ... old list dis 50&5 %
Plow, R. B. & W. ... dis 30 %
Stove, R. B. & W. ... dis 10 %
" Shelton Co. Shaved Heads ... dis 15 %
Union Nut Co., old list ... dis 50&20 %
" " Stove ... dis 15 %
Machine ... dis 30&10 %
Borax.—In cases of 100 lbs ... ℘ lb 20c
In barrels ... ℘ lb 19c

Boring Machines.
Kellogg's ... dis 15 %
Snell Mfg. Co., Rice's Patent ... dis 15 %
" " Regular ... dis 15 %
Douglas Mfg. Co. ... dis 20 %
Morticing Machines each ... $18 00
Bow Pins. ... dis 50 %

Braces.
Barber's Patent ... dis 40 %
Wilson Mfg. Co. ... new list dis 10 %
Spofford's Patent ... dis 40 %
Noble's Patent ... dis 40 %
Bartholomew's American Ball ... dis 10&10 %
" Patent Grip ... dis 40 %
Ives' Novelty ... dis 40 %
Bull Rings. ... dis 50 %

Bung Hole Borers.
Common and Ring ... dis 25 %
Enterprise Mfg. Co. ... dis 20&10 %
Ives' Tap Borers ... dis 25 %

Butchers' Cleavers.
Bradley's ... dis 25 %
Beatty's ... new list dis 10 %
2 3 4 5 6 7 8 9
$19·00 $21·50 $24·00 $27·00 $30·00 $33·50 $36·50 $40·00
Hart Mfg. Co. ... dis 45&10 %
0 1 2 3 4 5 6
$25·25 $29·75 $30·25 $38·75 $43·55 $48·50 $54·00

Butts.
Wrought Brass ... new list dis 30 %
Cast Fast Joint, Narrow ... dis 50 %
" " Broad ... dis 50 %
Cast Loose Joint ... dis 60 %
" " Mayer ... dis 50 %
" " Parliament ... dis 50 %
Loose Pin ... dis 33⅓&10 @ 40&10 %
Wrought Fast Joint, Narrow ... dis 30 %
Wrought Broad ... dis 35 %
" Loose Joint ... dis 35 %
Wrought Table and Back Flaps ... dis 30 %
Palmer Blind Butts ... dis 30&10 %
Nicholson Blind Butts ... dis 40&10 %
Parker's Blind Butts ... dis 45&10 %
Huffer's Blind Butts ... dis 30&10 %
A. S. Parker's ... dis 40&10 %
Clark's Surface Blind Hinges, Nos. 1, 3 and 5 ... dis 50 %
" " " " No. 20 ... dis 55&10 %
" Mortise " " ... dis 30&5 %
Seymour's ... dis 40&10 %
Shepard's ... dis 50 %
Garretson's ... dis 60 %
The American Spiral Spring Butt Co. ... dis 20 %
Standard ... dis 40&10 %

Caps—Percussion, per 1000.
G. D. ... 40c
Ely's E. B. ... 1-4s, 58c.; 1-10s, 65c., gold
" Double Waterproof, 1-4s, $1·45; 1-10s, $1·52½c., gold
Colt's ... 1-10s, 70c., gold

Cartridges.
Metallic ... dis 50 @ — %
Cards.—Horse and Curry ... dis 25&10 %
Cotton ... new list dis 10&10 %
Wool ... new list dis 10&10 %

Carpet Stretchers.
P. S. & W. ... per doz $2 00; dis 33⅓ %

Casters.
Iron and Wood Wheel, Bed ... dis 30&10 %
Brass and Porcelain Wheel, Bed ... dis 30&10 %
Deep Socket, Bed ... new list dis 20&10 %
Iron and Wood Wheel Plate ... new list dis 30&10 %
Brass Wheel Plate ... new list dis 30&10 %
Porcelain Wheel Plate ... new list dis 30&10 %
Cattle Leaders ... dis 50&10 %

Chain
English Coil, by the cask ... net gold
℘ lb ... 13 9½ 9 8½ 8⅛ 8c
3-16 ¼ 5-16 ⅜ 7-16 ½
Trace, 6½-10-2 ... by the cask, ℘ pair, gold, 62c
Trace, 7-10-2 ... by the cask, ℘ pair, gold, 67c
Galvanized Pump Chain ... ℘ lb 14c
German Halter Chain ... new list, Jan. 1, dis 10 %
German Coil ... new list, Jan. 1, dis 10 %
Jack Chain, Iron ... dis 50 %
" Brass ... dis 40 %

Chalk.
White ... ℘ gross, 50c
Red ... ℘ gross, 75c
Blue ... ℘ gross, 90c
Crayons ... ℘ gross, 14c

Cherry Stoners.
"Family" ... ℘ doz $4·00

Chisels.
Socket Firmers ... dis 60 @ 60&10 %
Socket Framing ... dis 60 @ 60&10 %
Socket Corner ... dis 60 %
Tanged Firmers ... dis 40 to 40&10 %
Butcher's ... $5·50 to £ gold—new list
Newbould's ... $5·50 to £ gold
Spear & Jackson's ... $5·50 to £ gold—new list

Clips, Axle.
Norway or Best ... dis 25 %
Superior ... dis 50 %
"Star," Superior Philadelphia ... dis 45&5 %

Coal Shovels.
Iron Handled ... ℘ doz, $ 85 @ 1 25
Wooden Handled ... ℘ doz, 1 00 @ 2 00

Coal Hods.—Smith, Burns & Co. ... dis 35 %
No. 14 15 16 17 18
Japanned ... $9·00 9·75 10·50 12·00 13·50 per doz
Galvanized ... 13·00 14·50 15·50 17·50 19·50 "
Morning Glory ... dis 30 %
No. 15 16 17
Japanned ... $12·50 13·50 15·50 per doz
Galvanized ... 18·00 19·50 21·00 "
Cockeyes ... dis 30 %

Cocks.
Brass Racking ... dis 25&10 %
Lock and Globe ... dis 25&10 %

Coffee Mills.
Board and Box ... dis 15 %
Increase Wilson's ... new list dis 15 %
Selsor's Pat. ... $9·50, $10·50—dis 20 %
French Steel ... dis 15 %
Swift's ... dis 20 %
"American" ... dis 20 %

Compasses and Dividers.
Bemis ... dis 35 %
Excelsior ... dis 30 %
Peck Stow & Wilcox ... dis 25 %

Coopers' Tools.
Bradley's ... dis 15 @ 20 %
Chas. E. Little ... dis 15 @ 20 %
Swan & Brombacher ... dis 15 @ 20 %

Corn Knives and Cutters.
Bradley's ... dis 10 %

Crucibles.
Gautier & Co. ... ℘ No. 5½c

Curry Combs.
Hotchkiss' and Kellogg's, Iron and Brass ... dis 15 %
Fitch's ... dis 20 %
Rubber ... ℘ doz, $9·00—dis 10 %
Schweitzer Mfg. Co. ... dis 20 %

Curtain Pins.
Silvered Glass ... dis 40&10 %

Cutlery.
American Table ... net list
American Pocket ... dis 25 %

Dog Collars.
Embossed Gilt ... dis 10 %
Leather ... dis 20 %

Door Springs.
Gray's ... $7·50 per doz—dis 40&10 %
Torrey's Patent ... $7·50 ℘ doz—dis 40&10 %
Palmer's Japanned No. 6 ... ℘ doz $5·00
" Coppered " ... " 6·00
" Silvered " ... " 8·00
Challenge.—
Japanned ... ℘ doz $4 00 @ 6 00
Bronzed ... ℘ doz 5 00 @ 7 00
Nickel Plated ... ℘ doz 6 50 @ 9 00
1 Gross lots ... dis 10 %
5 Gross lots ... dis 20 %
Drawing Knives ... dis 60 @ 60&10 %
Bradley's ... dis 25 %
Adjustable Handled ... dis 10 %

Drills.
Ingersoll's Ratchet ... dis 25 %
Moore's Triple Acting Ratchet ... dis 20 %
Whitney's Ratchet ... dis 20 %
Blacksmiths' ... each $3 25 net

Drug Mills.
American Drug Mills ... dis 20 %

Egg Beaters.
Monroe's ... ℘ doz net $8·25 @ 8·50
Dover ... ℘ doz net $6·00
National ... ℘ doz $4·50—dis 10 %
Peerless ... ℘ doz net $4·00

Emery.
Genuine Chester—Regular Nos. ... ℘ lb 7c } dis 5 @ 10 %
" Flour and FF ... ℘ lb 4c }
Washington Mills—Regular Nos. ... ℘ lb 8c
" Flour ... ℘ lb 5c

Enameled and Tinned Ware.
Kettles ... dis 20 @ 25 %
Sauce Pans, Glue Pots, &c. ... dis 15 %

Faucets.
Cork Lined, Wood ... dis 60 %
Fenn's ... dis 50 %
" Cork Stops ... dis 40 %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 10&10 %
Taylor's Pattern " ... dis 20&10 %
Wood and Metallic ... dis 40 %
Felloe Plate ... ℘ lb 14c; dis 10 %

Files.
Nicholson ... $5 00 to £ currency—dis 10 %
Newbould's ... 5 25 to £ gold
J. & Riley Carr's ... 5 50 to £ gold
" " Rasps ... 5 75 to £ gold
Stubs' ... 8 50 @ 9 00 to £ gold
Butcher's ... 5 50 to £ gold
Walter Spencer & Co.'s "Diamond" ... 5 25 to £ gold
Spear & Jackson's ... 5 50 to £ gold
Hargreaves, Smith & Co.'s ... 5 00 to £ gold
Jowitt's ... 5 25 to £ gold
"Western" ... 5 00 to £ net
W. K. & C. Peace's "Imperial" ... 5 25 to £ gold
R. Ibbotson ... 5 00 to £ gold
Beam & Murray, "Cyclops" ... 4 85 to £ gold
Fisher's ... 4 75 to £ gold
Goodlad's ... 4 00 to £ gold
Moss & Gamble ... 5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) ... 5 00 to £ gold
" " Horse Rasps ... 5 50 to £ gold

Fluting Machines.
Acme ... $7 00 each net
Manville, No. 2 ... 7 00 each net
Knox, with 4-inch Rolls ... 5 00 each net
" " 6 " ... 6 00 each net
O. K. ... 6 50 each net
Peerless, 4-inch Rolls ... 4 00 each net
" 5 " ... 5 00 each net
Excelsior, No. 1 ... 4 75 each net
" No. 2 ... 6 50 each net
Diamond ... 7 50 each net
Climax 7-inch Rolls ... 8 00 each net
" 4½ " ... 6 50 each net
Empire ... 4 00 each net
Eureka, No. 1, 7-inch Roll ... 8 00 each net
" No. 2, 5-inch Roll ... 6 00 each net
K. F. M., 4½-inch Roll ... 5 60 each net
" 6-inch Roll ... 6 00 each net
Myers' Fashion Fluter, 4½-inch Rolls ... 8 00 each net
" Convex Brass Fluter, Sad Iron attachment ... $1·75
Domestic Fluter ... $1·75 each net
Fairy, Self-Heater ... 8 00 each net
Ponton Fluter, Bright ... $1 50—dis 25 %
" " Galvanized ... 2 00—dis 25 %
Geneva Hand Fluter ... $15 00 per doz net
Champion, 6 inch rolls ... $6 00 each net

Forks.
Hay, Manure & Spading ... dis 25 %
Plated A 1 ... dis 30&5 %

Fry Pans.—P. S. & W.
Tinned ... dis 25 %
℘ doz ... $3·00 3·25 3·62 4·00 4·50 5·00 5·50 6·00 7·50
No. ... 0 1 2 3 4 5 6 7 8
Smith, Burns & Co., "Excelsior" Polished ... dis 20 %
℘ doz ... $3·70 4·00 4·70 5·30 6·00 7·00 8·00 9·00
No. ... 1 2 3 5 6 7 8

Hammers.
Emmet Hammer Co. ... dis 10 %
Maydole's ... dis 5 %
Cheney's ... new list net
Verree ... dis 5 %
Yerks & Plumb ... new advanced list dis 5 @ 10 %
Minot & Co. ... dis 15 %

Handles.
Hammer and Hatchet ... dis 10 %
Quakertown, Axe, Pick and Sledge ... dis 10 %
" Hammer and Hatchet ... net
Greensboro', Axe, Pick, Hammer, &c. ... dis 10 %
Woolworth Axe, Pick and Sledge ... dis 10 %
Brad Awl ... per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 10&10 %
" " " large " 6 25—dis 10&10 %
Apple " " ass'td " 6 00—dis 10&10 %
" " " large " 7 00—dis 10&10 %
Socket " " ass'td " 3 50—dis 10&10 %
" Framing " " " 6 00—dis 10&10 %
File ... " " 3 50—dis 10&10 %
Auger ... " " 5 50—dis 10&10 %
" large " 6 50—dis 10&10 %

Harness Snaps.
Henshaw's ... dis 25&10 %
Judd's ... dis 40 %
Fitch's ... dis 30 %
Hotchkiss' ... dis 10 %
Andrews' ... dis 25 %
Sargent's ... new list dis 50&10 %

Hatchets.
Isaiah Blood ... dis 10 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 50 8 00 8 50
Claw, " 1 2 3 ... ℘ doz 8 50 9 00 9 50
Lathing, " 1 2 3 ... ℘ doz 7 50 8 00 8 50
Hunt's ... net
Shingling, Nos. 1 2 3 ... ℘ doz $7 25 8 00 8 75
Claw, " 1 2 3 ... ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ... ℘ doz 7 50 8 25 9 00
Hurd's ... dis 20 %
Shingling, Nos. 1 2 3 ... ℘ doz $8 00 8 50 9 00
Claw, " 1 2 3 ... ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ... ℘ doz 8 00 8 50 9 00
Newark's Edge Tool Co.'s ... dis 25 %
Shingling, Nos. 1 2 3 ... ℘ doz $6 50 7 00 7 50
Claw, " 1 2 3 ... ℘ doz 7 25 7 75 8 25
Lathing, " 1 2 3 ... ℘ doz 6 50 7 00 7 50
Yerks & Plumb ... dis 10 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 00 7 50 8 00
Claw, " 1 2 3 ... ℘ doz 7 50 8 00 8 50
Lathing, " 1 2 3 ... ℘ doz 7 00 7 50 8 00
Simmon's ... dis 10 %
Shingling, Nos. 0 1 2 3 ... ℘ doz $7 50 8 00 8 50 9 00
Claw, " 1 2 3 ... ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ... ℘ doz 8 00 8 50 9 00
Broad, " 1 2 3 ... ℘ doz 9 00 10 00 12 00
" " 4 5 6 ... ℘ doz 14 00 16 00 18 00
" " 7 8 ... ℘ doz 20 00 22 00
Elephant ... dis 25 %
Shingling, Nos. 1 2 3 ... ℘ doz $8 50 8 50 9 00
Claw, " 1 2 3 ... ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ... ℘ doz 8 00 8 50 9 00
J. P. Verree & Co. ... dis 5 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 00 7 50 8 00
Claw, " 1 2 3 ... ℘ doz 7 50 8 00 8 50
Lathing, " 1 2 3 ... ℘ doz 7 00 7 50 8 00
Underhill's ... dis 10 %
Shingling, Nos. 1 2 3 ... ℘ doz 7 25 8 00 8 75
Claw, " 1 2 3 ... ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 ... ℘ doz 11 00 12 00

Hinges.
Wrought Strap and T ... dis 25&7½ %
Providence Plate. {6 and 8 in. list 11c. / over 8 in. list 9½c.} dis 10&5 @ 10&10 %
Screw Hook and Strap ... {8, 10, 12 in. 8½c / 14 to 36 in. 7c} ... net
Heavy Welded Hook ... {8 to 12 in., 9c / 14 in & up, 8½c} dis 10 %
Screw Hook and Eye ... {⅝ to 1 in., 9½c / ⅜ in. 10½c / ¼ in. 12½c} ... net

Hoes.
Solid Shank, C. S. ... ℘ doz $8 00—dis 20 @ 30 %
Socket ... ℘ doz 9 00—dis 20 @ 30 %
Riveted Eye ... ℘ doz 5 00—dis 20 @ 30 %
Grub ... dis 20 %
Planters'—Winsted ... add 10 %
Scovill ... add 33⅓ %
Scovill Pattern (Winsted) ... add 20 %

Hooks.
Belt ... dis 50 %
Bench—Hotchkiss' $6 00 ℘ doz ... dis 10 %
Bench—Weston's No. 1, $8·50; No. 2, $7·00 per doz net
" —McGill's ... $3 00 per doz, dis 10 %
Wardrobe, Japanned ... new list dis 55&5 %
Hat and Coat " ... new list dis 55&5 %
Wrought Staples and Hooks and Staples ... dis 60&10 %
Screw Hooks and Eyes, revised list ... dis 70 %

Horse Nails.
Putnam's.
No. ... 5 6 7 8 9 10
32c 28c 26c 25c 24c 23c
In lots 2000 lbs. dis. 5 %.
Ausable
No. ... 5 6 7 8 9 10
30c 27c 25c 24c 23c 22c
Pointed & finished ... 31c 28c 26c 25c 24c 23c
Clinton ... 22c 19c 17c 16c 15c 14c
In lots of 1000 lbs. 5 % discount.
Brundage.
No. ... 5 6 7 8 9 10
29c 26c 24c 23c 22c 21c
In lots of 500 lbs., dis. 5 %.
American Pressed.
No. ... 5 6 7 8 9 10
22c 20c 20c 20c 20c 20c
In lots of 1000 lbs. dis 5 %.
Perkins Finished (ready to drive).
No. ... 5 6 7 8 9 10
31c 28c 26c 25c 24c 23c
In lots of 1000 lbs. dis 5 %.
Buffalo Forged.
No. ... 5 6 7 8 9 10
28c 26c 25c 24c 23c
Globe (Pointed and Polished).
No. ... 5 6 7 8 9 10
31c 28c 26c 25c 24c 23c
In lots of 1000 lbs., 5 % discount.
National (Pointed and Polished), Extra Finish.
No. ... 5 6 7 8 9 10
30c 27c 25c 24c 23c 22c
In lots of 1000 lbs., dis 5 %.
Vulcan (Blued, pointed, ready to drive).
No. ... 5 6 7 8 9 10
33c 30c 28c 27c 26c 25c
In lots of 500 lbs., 5 % discount.
" 1000 lbs 7½ % discount.
New London Horse Nails.
No. ... 6 7 8 9 10
Great Western ... 27c 25c 24c 23c 22c
U B ... 29c 27c 26c 25c 24c
In lots of 1000 lbs., dis 5 %.
Star Brand ... ℘ lb 16c
Morgan ... 14c

Horse Shoes.
Burden ... ℘ keg, $5 87½
R. I. Horse Shoe Co., Perkins Pattern ... ℘ keg, 5 87½
" " R. I. Pattern ... ℘ keg, 6 37½
Mule Shoes ... ℘ keg, 6 87½

Kettles.
Brass ... ℘ lb 55c net
In lots of 500 lbs ... ℘ lb 50c net

Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe " ... dis 15 %
Hay and Straw, "Wadsworth's" ... dis 20 %

Knobs.
Base—Common ... net
" Plush Tip ... dis 10 %
" Elastic End ... reduced list dis 10&10 %

Ladles.
Melting ... dis 20 %

Lanterns.
Brady's Patent ... dis 10 %
Ætna ... dis 10 %
Yankee ... dis 10 %
De Beque ... dis 10 %

Locks and Latches.
Cabinet—Eagle ... dis 25 %
Cabinet—Gaylord ... dis 25 %
Trunk ... dis 10 %
Continental ... dis 15 %
Shepardson's ... dis 20 %
American Lock Co. ... dis 33⅓ %
Trenton Lock Co., Branford, Norwich, Russell & Erwin, Norwalk, Nashua, Mallory, Wheeler & Co. ... New list dis 45 %. 2 % extra for cash.

Mallets.
Hickory and Lignumvitæ ... dis 10&10 %

Meat Cutters.
Dixon's (P. S. & W.) ... dis 10 %
No. ... 1 2 3 4
℘ doz ... $14 00 $17 00 $19 00 $20 00
Hales' ... dis 25 %
No. ... 11 12 13
℘ doz ... $27 00 $33 00 $42 00
Miles Challenge ... dis 20 %
No. ... 1 2 3
℘ doz ... $22·00 $30 00 $40 00
Perry's Champion (P. S. & W.) ... dis 10 %
No. ... 200 300 400
℘ doz ... $22 00 $27 00 $40 00
Woodruff's (P. S. & W.) ... dis 10 %
No. ... 100 150
℘ doz ... $15 00 $18 00
American ... dis 25 @ 25&5 %
No. ... 1 2 2½ 3 4 5
Each ... $6 00 $9 00 $14 00 $15 00 $30 00 $75 00

Molasses Gates.
Stebbins' Pattern ... dis 60&10 %
Tinned ends ... dis 40&10 %
Patent Self-Measuring ... per doz $42 00—dis 20&10 %

Mortars and Pestles.
Iron ... net

Mouse Traps.
Wood Choker ... ℘ doz holes, 16 @ 18c
Nails.—See Trade Report.

Nuts and Washers.
Nuts ... large, 5½c; small, 7½c off list.
Washers ... large, 7c; small, 9c off list.

Oil Stones.
Washita No. 1 ... ℘ lb 22c
" Slips ... ℘ lb 44c
Hindostan ... ℘ lb 6c dis 10&10 %
" Slips ... ℘ lb 10c dis 10&10 %

Oilers.
Olmsted's ... new list dis 25&10 %
Broughton's ... dis 25&5 %
Malleable ... per doz $5 00 net
Common Tin ... dis 30 %
" Zinc ... dis 30 %
" Brass and Copper ... dis 30 %

Picks.
Washoe R. R. ... dis 25 % ... Nos. 1 3 4 5
℘ doz ... $14·00 15·00 16·00 17·00 18·00
Washoe Coal, dis 20 % ... $8·50 9·00 10·00 11·00 13·00 15·00

Picture Nails and Knobs.
Richards' Patent ... dis 40 @ 40&10 %
Pinking Irons ... per doz $3 00—dis 60&10 %

Planes.
Chapin's, 1st quality ... dis 30 %
Sandusky Tool Co., 1st quality ... dis 30 %
" " 2d " (Ogontz) ... dis 40 %
Ohio Tool Co., 1st quality ... dis 30 %
" " 2d quality (Scioto) ... dis 40 %
Owasco Tool Co., 1st quality ... dis 30 %
" " 2d quality ... dis 40 %
Howland's, 1st quality ... dis 30 %
Bailey's Patent Adjustable ... dis 20&10 %
Plane Irons, Butcher's ... $5 50 to £ gold—new list
" Chapin's ... dis 10&10 %
" Ohio Tool Co. ... dis 10 %
" Spear & Jackson's ... 5 50 to £ gold—new list
" Sandusky Tool Co. ... dis 10 %

Plumbs and Levels.
Chapin's ... dis 60&10 %
Standard Rule Co.'s New Adjustable ... dis 50&10 %
Stanley Rule and Level Co. ... dis 60&10 %

Pumps.
Douglas Cistern, etc ... new list dis 25 %
" S. & F. ... new list dis 20 %

Rakes.
Cast Steel ... dis 30 %
$8 00 9 00 10 00 11 00
8 10 12 14 teeth.

Razor Straps.
Genuine Emerson ... dis 25 %
" " in 5 gross lots ... dis 30 %
Hunt's ... dis 35 %
Chapman ... dis 10 @ 15 %

Rivets.
Iron and Tinned ... dis 25 %
Copper Rivets and Burrs ... new list dis 10 %

Rods.
Stair ... new list dis 30 %
American Patent ... dis 30 %

Rope. Manufacturers' List
Manila ... ½ inch and larger ℘ lb 16½c
" ... ⅜ inch ℘ lb 17 c
" ... ¼ and 5-16 inch ℘ lb 17½c
" Lath Yarn ... ℘ lb 16 c
" Hay Rope ... ℘ lb 17 c
Sisal ... ½ inch and larger ℘ lb 15½c
" ... ⅜ inch ℘ lb 16 c
" ... ¼ and 5-16 inch ℘ lb 16½c
" Hay Rope ... ℘ lb 15 c

Rules.
Chapin's Boxwood ... dis 60&10 %
" Ivory ... dis 50&10 %
Hubbard & Curtiss Mfg. Co. ... new list net
Stanley Rule and Level Co.'s Ivory ... dis 50&10 %
" " " Boxwood ... dis 60&10 %
Standard Rule Co.'s Boxwood ... dis 60&10 %
" " " Ivory ... dis 50&10 %

Sad Irons.
... ℘ lb 4½c net
Sad Iron, Nickel Stand attached ... ℘ lb 9c

Sand Paper—dis 7½ @ 10 %
Beader & Adamson's (Flint) 00 to 1½ ... $4 25 ℘ ream
" " " 2, 2½ & 3 ... 4 75 "
Assorted ... 4 25 "
Star ... ℘ ream $3 25
Emery ... ℘ ream $6 50 @ 11 50
Cowdin Mfg. Co. ... dis 7½ @ 10 %
Diamond Flint, 00 to 1½ ... per ream $4 25
" " 2, 2½, 3 and assorted ... 4 75
" Emery Paper ... per ream $6 50 to $11 50

Sash Locks.
Clark's ... dis 20 %
Ferguson's ... dis 20 @ 25 %
Norwich ... dis 15 %

Sash Weights.
Solid Eyes ... ℘ lb 2½c

Sausage Fillers.
Perry's (P. S. & W.) ... dis 10 %
No. ... 1 0
℘ doz ... $15 00 $21 00
Saw Rods ... dis 10 %

Saws.
Spear & Jackson's ... $4 50 to £ gold
John Spear ... $3 60 to £ gold
Am. Saw Co. ... new list
Perforated Cross Cuts, all kinds ... 68c ℘ foot
Inserted Tooth ... dis 10 %
All else ... dis 12½ %
Disston's Circular ... dis 20 %
" Mill ... dis 25 %
" Cross Cut ... dis 15 %
" other kinds ... dis 12½ %
Livingston's Framed Wood ... dis 5 %
H. W. Peace's Circulars ... dis 10 %
Other kinds ... dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular ... new list dis 10 %
E. M. Boynton's Lightning, dis 30&5 % for immediate cash
" Others ... dis 15 %

Saw Sets.
Nash's ... dis 20 %
Bemis' ... dis 10 %
Aiken's Genuine ... dis 25 %
Hotchkiss' ... dis 10 %
Common Lever ... per doz $1 80 net

Scales.
Turnbull's ... dis 15 %
Brown's ... dis 25&5 %
Fairbanks' ... new list dis 15 @ 20 %
Howe's ... dis 15&5 %
Shattuck's Counter and Union ... dis 15 %
Chatillon's Grocers' ... dis 25 %
Eureka ... dis 25 %
Scale Beams ... dis 25 %
No. 1 300 to 1200 lbs ... 90c ℘ cwt
No. 2 " " ... 75c ℘ cwt

Screws.
American list of Jan. 1, 1874.
Flat Head Iron ... dis 52½ %
Round Head Iron ... dis 50 %
Flat Head Brass ... dis 52½ %
Round Head Brass ... dis 50 %
Round Head Silver Capped ... dis 25&10 %
Hand Rail ... dis 33⅓ %
Coach or Lag ... dis 30&10 %
Coach, Patent Gimlet Point ... dis 5 %
Bed ... list net
English—Nettlefold & Chamberlain's Flat Head Iron ... dis 52½&10 %
Machine—Flat Head, Iron ... dis 60 %
" " Brass ... dis 10 %
Round Head, Iron ... dis 55 %
" " Brass ... net
Bench—Iron, Wilson's ... dis 20 %
" —Wood ... dis 15 %
Hand ... dis 25&10 %
Jack—Bell Bottom ... dis 15 %

Scythes.
Blood's German Steel, Grass ... ℘ doz $9 00
" Cast " " ... ℘ doz 10 00
" Silver " " ... ℘ doz 11 00
" German " Grain ... ℘ doz 13 00
" Cast " " ... ℘ doz 14 00
" Red Rover ... 12 00
" Young America ... 9 50
" Silver Clipper ... 12 63
Scythe Snaths ... dis 20 %
Sieves.—Mann's Patent ... dis 15 %

Shears.
Cast Steel ... dis 60&10 %
Conn. Cutlery Co., new brand ... dis 60 %
Rowe's ... dis 50&10 %

Shovels and Spades.
Ames ... new list dis 12½ %
Rowland ... dis 20&5 %
Old Colony ... new list dis 10&5 %
N. B. Sherman ... old list dis 7½ %

Shovels and Tongs.
Iron Head ... list net
Brass Head ... dis 5 %
Polished Steel ... new list dis 15 %

Slates.
Square Frames, Round Cornered, by case ... dis 60&10 %
Less than a case ... dis 50 @ 55 %
Oval Frames, by case ... dis 40 @ 40&10 %
Less than a case ... dis 30 %

Spoons.
Iron ... new advanced list, dis 10 %
By the case ... dis 20 %
Britannia ... dis 40@40&10 %
Plated A 1 ... revised list dis 30&5 %
German Silver ... revised list dis 10&10 %
Tinned (P. S. & W.)—
Teas ... $1·80 ℘ gross, net
Tables ... 2·75 " net
Stocks and Dies ... dis 15 %

Stove Polish.
Gem ... ℘ gross $5 00, dis 10 %
Joseph Dixon's ... ℘ gross, 6 00
National ... ℘ gross $4 75
Gold Medal ... ℘ gross $6 00, dis 15 %

Squares.
Steel ... dis 50 %; full cases, dis 50&10 %
Iron ... dis 50 %; full cases, dis 50&10 %
Nickel Plated ... add $2 50 @ $4 00 ℘ doz net
Try Squares and T Bevels ... dis 45&10 %
Star Try Squares and Bevels ... dis 30 %

Tacks.
Full Weight American Iron ... dis 40&7½ %
Half Weight American Iron ... dis 70&7½ %
Carpet ... dis 7½ %
Brads American Half Weight ... dis 50&7½ %
Finishing Nails ... ⅜ ⅝ ¾ 1 1¼ in. and over
℘ lb ... 25c 20c 18c 14c 13c dis 7½ %
Trunk and Clout ... ⅜ ⅝ ¾ 1 1¼ in. and over
℘ lb ... 25c 20c 18c 14c 13c dis 7½ %
Copper Tacks ... ℘ lb 50c—dis 7½ %
Iron Shoe Nails, ℘ lb 4-8 and longer, 10c; 3½-8, 10½c ... dis 7½ %
Double Pointed ... new list dis 33⅓ %

Tapes, Measuring.
American Flask and Cap Co. ... dis 20 %
Eddy's ... dis 20 %

Thermometers.
Tin Case ... dis 50 %

Toe Calks.
... ℘ lb 13c net

Tobacco Cutters.
Champion ... dis 20&10 %
Peck, Stow & Wilcox ... dis 10 %

Tinners' Tools and Machines.
P. S. & W. ... list net

Traps.
Newhouse ... dis 20 %
Hotchkiss ... dis 20&10 %
Peck, Stow & Wilcox ... dis 30 %
Blake's Patent ... dis 15 @ 20 %

Trowels.
Lothrop's Brick and Plastering ... dis 10 %
Disston's " " ... dis 12½ %
Brades' " " ... gold, net
Worrall's " " ... dis 15 %
Garden ... dis 20 %

Vises.
Trenton Vises, Solid Box.
30 to 160 lbs ... 16c
160 and over ... 15c
Peter Wright's ... ℘ lb 15½c. gold
Wilson's Solid Box ... dis 15 %
30 to 160 lbs ... 18c
160 and upward ... 22c
Wilson's Parallel ... dis 30 %
Backus & Union, Parallel ... dis 25 %
Buffalo, Parallel ... new list dis 20 %
Fisher & Norris' Double Screw Parallel ... dis 15 @ 15&5 %
Trenton Parallel ... dis 15 %
Bonney's Saw Filers ... dis 20 %

Wheel Barrows.
Pugsley & Chapman—Canal ... dis 10&5 %
Coal, Garden and Stone ... dis 20 %

Wheel Heads.
Brass Bushed ... per doz $3 25 net

Well Wheels.
Revised list ... dis 55&10 %

Wire.
Bright and Annealed ... Nos. 0 @ 18 dis 35 @ 40 %
" " ... " 19 @ 26 dis 45 @ 50 %
" " ... " 27 @ 36 dis 50 @ 55 %
Coppered ... " 0 @ 18 dis 25 @ 30 %
Galvanized, Nos. 0 to 12 ... dis 40 @ 45 %
Galvanized, Nos. 13 to 18 ... dis 45 @ 50 %
Tinned ... dis 20 @ 25 %
Cast Steel ... 5 @ 10 %
Tinned Broom Wire ... dis 25 @ 30 %
Galvanized Telegraph, Nos. 8 and 9 ... ℘ lb 10c @ 11c
" " " 10 and 11 ... ℘ lb 11c @ 12c
" " " 12 ... ℘ lb 11½c @ 12½c
Annealed Fence, Nos. 8 and 9 ... dis 35 @ 40 %
" Grape, " 10 to 14 ... dis 35 @ 40 %
Fence Staples ... ℘ lb 8½ @ 9 %
Stubs' Steel Wire ... $7 00 to lb gold

Wrenches.
American Adjustable ... dis 45 %
Baxter's Adjustable "S" ... dis 20 %
" Diagonal ... dis 20 %
Collins & Co.'s ... dis 40 %
Coes' Genuine ... dis 40 @ 40&5 %
" Pattern (Wrought) ... dis 50 %
" " (Malleable) ... dis 60&10 %
Lindsay's Patent ... dis 25 %
Taft's Pattern ... dis 70 %
Davis' Patent Duplex ... new list dis 25 %
Bemis & Call's Patent Combination ... dis 20&5 %

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE.

Basins.
Wash Basins, Handled, Plain Stamped ... dis 25 %
Inch ... 10 11 11½
Per doz ... $3·50 4·00 4·50
Wash Basins, Handled, Retinned ... dis 25 %
Inch ... 10 11 11½
Per doz ... $4·00 4·50 5·00
Wash Basins, with Feet, Plain Stamped ... dis 25 %
Inch ... 10 11 11½ 13½
Per doz ... $2·00 2·50 2·75 3·75
Wash Basins, with Feet, Retinned ... dis 25 %
Inch ... 10 11 11½ 13½
Per doz ... $3·00 3·50 4·00 5·00
Wash Basins, Stamped ... dis 25 %
Inch ... 10 10½ 11½
Per doz ... $1·70 2·10 2·50
Inch Shallow ... 10 11
Per doz ... $1·55 1·80
Wash Basins, Retinned ... dis 25 %
Inch ... 10 10½ 11½
Per doz ... $2·50 3·00 3·50
Inch Shallow ... 10 11
Per doz ... $2·00 2·00

Covers.
Bucket ... dis 10 %
1 pt. 1 qt. 2 3 4 6 8 10 12 qt.
Per gross ... $2·25 3·00 4·00 4·50 5·75 7·75 8·75 9·25 13·00
Coffee Pot ... dis 10 %
3 pt. 2 qt. 3 4 6 qt.
Per gross ... $1·25 1·50 1·75 2·25 3·50
Pot ... dis 10 %
Inch ... 7½ 7¾ 8¼ 8¾ 9¼ 9¾ 10¼
Per gross ... $5·50 6·00 6·75 7·25 8·00 8·50 10·25
Inch ... 10¾ 11¼ 11¾ 12¼ 13¼
Per gross ... $11·00 11·75 12·50 15·50 19·00
Tea Kettle Breasts and Covers ... dis 10 %
Inch ... 5½ 6½ 7½ 8 8½ 9
Per gross ... $6·00 6·50 8·00 9·00 9·75 10·50
Inch ... 9½ 10 10½ 11 11½ 12½ 13½
Per gross ... $11·25 13·00 14·00 15·00 16·00 21·00 24·00
Dipper Bowls, Plain Stamped ... dis 25 %
Pints ... ½ ¾ 1 1½ Quarts ... 1 2 2½
Per doz. ·50 ·60 ·70 ·80 Per doz ... ·90 1·25 1·50
Dipper Bowls, Retinned ... dis 25 %
Pints ... ½ ¾ 1 1½ Quarts ... 1 2 2½
Per doz. ·75 ·95 1·00 1·15 Per doz ... 1·30 1·55 1·90

Pans.
Dish Pans, Tinned ... dis 25 %
Quarts ... 7 8 10 14 17 21 30
Per doz ... 8·50 9·50 11·00 13·00 16·00 19·00 30·00
Milk Pans, Plain Stamped ... dis 25 %
Quarts ... ½ 1 1½ 2 3 4 5 6 8 10
Per doz ... $ ·85 1·05 1·20 1·45 1·65 2·40 2·90 3·15 4·40 5·00
Milk Pans, Retinned ... dis 25 %
Quarts ... ½ 1 1½ 2 3 4 5 6 8 10
Per doz ... $1·15 1·40 1·60 1·90 2·15 3·00 3·40 3·80 5·20 6·00
Pie Plates ... dis 10 %
Inch ... 6 7 8 9 10 11
Per gross ... $4·50 5·00 7·25 7·75 10·50 12·00

JAPANNED TIN WARE.

Cannisters, Common ... dis 10 %
Pound ... ½ 1 2 3
Per doz ... $1·10 1·60 2·50 3·25
Cannisters, Hinged ... dis 10 %
Pound ... 1 2 3 4 6
Per doz ... $1·75 2·75 3·40 3·75 4·50
Candlesticks, Japanned ... dis 10 %
No ... 1 2
Per gross ... $8·00 7·00
Cake Boxes, Round ... per nest, $3·25, dis 10 %
" Square ... per nest, 4·25, dis 10 %
Chamber Pails, Japanned (Smith, Burns & Co.) ... dis 10 %
Nos ... 2 3 4 5
Green, per doz ... $8·00 9·00 10·50 12·50
Oak " ... $9·50 10·50 12·00 13·50
Dust Pans, Corrugated ... per gross, $22·00, dis 10 %
Box Graters ... per gross, $4·00, dis 10 %
Molasses Cups ... dis 10 %
Pint ... ½ 1 2
Per doz ... $1·25 ·50 2·75
Pepper Boxes Japanned ... dis 10 %
Per gross ... Small, $3·00; Large, $4·00
Toy Banks, House ... dis 10 %
No ... 1 2
Per gross ... $7·00 5·50
Toy Banks Gothic ... dis 10 %
No ... 1
Per gross ... $5·50
Toy Cups, Straight ... dis 10 %
No ... 1 2 3
Per gross ... $4·00 3·50 3·50
Toy Cups, Flaring, nests of (3) ... per gross, $2·50, dis 10 %
Toy Pails, Covered ... dis 10 %
No ... 1
Per gross ... $4·50
Toy Rattles ... per gross, $2·25, dis 10 %
Trunks. Wire Handled ... per nest (5) $1·50, dis 10 %
Spittoons, Tin ... per gross, No. 2, $30, No. 3, $27, dis 10 %

PLANISHED TIN WARE.

Planished Coffee Pots, Round ... dis 25 @ 30 %
Each ... ·60 ·75 ·85 ·95 1·15 1·25 1·30 1·40
Pints ... 1 2 3 4 5 6 7 8
Planished Tea Pots, Round ... dis 25 @ 30 %
Each ... ·70 ·80 ·95 1·05 1·25
Pints ... 2 3 4 5 6
Planished Tea Pots, Oval ... dis 25 @ 30 %
Each ... ·70 ·80 ·90 1·05 1·15 1·40 1·75
Pints ... 1 2 3 4 5 6 8

Tea Pot Handles—P. S. & W. ... dis 20 %
Stow's Patent Hollow Tea Pot Handles.
No. 1, Small, 4½ inches ... per gross, $11·50
No. 2, Medium, 5½ " ... " 12·50
No. 3, Large, 6½ " ... " 13·50
No. 4, Ex. Large, 7½ in., for Wash Pitchers, &c. ... " 18·00
Stow's Patent. New Pattern.
No. 25, Small, 4½ inches ... per gross, $11·50
No. 35, Medium, 5½ " ... " 12·00
No. 45, Large, 6½ " ... " 13·00
Solid Iron, Tin Tipped.
No. 10, Small, 4½ inches ... per gross, $9·00
No. 15, Medium, 5½ " ... " 9·50
No. 20, Large, 6½ " ... " 10·75
Stow's Patent Hollow Tea Pot Handles, Adamantine Bronze—P. S. & W.
No. 12, Bronzed and Tin-Tipped ... per gross, $13·50
Saucepan Handles. Of Best Malleable Iron.
P. S. & W. ... dis 20 %
Japanned.
No. 1, 5½ inches long ... per gross, $3·50
No. 2, 6 " ... " 3·75
No. 3, 6½ " ... " 4·00
No. 4, 7½ " ... " 4·25
No. 5, 8 " ... " 4·50
No. 6, 9 " ... " 4·75
Tinned.
No. 1, 5½ inches long ... per gross, $4·25
No. 2, 6 " ... " 4·50
No. 3, 6½ " ... " 4·75
No. 4, 7½ " ... " 5·25
No. 5, 8 " ... " 5·50
No. 6, 9 " ... " 5·75
Japanned ... per lb., ·16
Tinned ... " ·20
Iron Kettle Ears (P., S. & W.) ... dis 45 %
Half gross pairs in a package.
Tinned.
Nos ... 1 2 3 4 5 6 7 8
Per gross pairs ... 88c $1·00 1·50 1·75 2·10 2·75 3·75 4·50
Black.
Nos ... 1 2 3 4 5 6 7 8
Per gross pairs ... 75c 88c $1·35 1·50 1·75 2·25 2·75 4·00
Tinned Tea Kettle.
Nos ... 4 5 6
Per gross pairs ... $1·75 2·10 2·75

METALS.

IRON.—DUTY: Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1½ to 1⅞ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb.

Pig Iron—AMERICAN.
Foundry No. 1 ... ℘ ton, $35 00 @ 36 00
Foundry No. 2 ... " 33 00 @ 34 00
Gray Forge ... " 29 00 @ 31 00
White and Mottled ... "
SCOTCH.
Coltness ... 43 00 @
Glengarnock ... " 40 00 @ 41 00
Eglinton ... " 38 50 @ 39 00

Bar Iron.
Am. Refined, at mill ... ℘ lb 3c @ 3 3c

Rails.
Welsh, gold ... ℘ ton,
American, at works, currency ... " 59 00 @ 60 00
Old Rails, T, currency ... " 40 00 @ 41 00

Scrap.
Wrought Scrap, from yard ... " 42 50 @

Bar Iron from Store.
Common Iron.
⅝ to 2 in. round and square ... ℘ ton, $ 70 00
⅝x9-16 in " " ... " 75 00
½ in. " " ... " 77 50
2¼ to 3 in. " ... " 75 00
1 to 6 in. wide x ⅜ and 1 in. thick ... " 70 00
1½ to 6 in wide x ¼ & 5-16 in. thick ... " 75 00
1 and 1½ in. x ¼ and 5-16 ... " 82 50
Swedish Iron
1½x⅜ and ½ ... " 170 00
1⅛x⅜ to ⅝, and ⅝ square ... " 165 00
1⅞ to 5x⅜ to ⅝ and ¾ to 2-in. square ... " 160 00
6 ... 8x⅜ and ½ ... " 170 00
Refined Iron.
⅝ to 2 in. round and square ... " 72 50
1 to 6 in. wide x ⅜ to 1 thick ... " 72 50
1½ to 6 in wide x ¼ and 5-16 thick ... " 77 50
1 and 1½ x ¼ and 5-16 ... " 77 50
Large Rounds.
2¼ to 2⅞, round and square ... " 80 00
3, 3¼ and 3½ in ... " 85 00
3¾ and 4 in ... " 82 50
Rods—⅝ and 11-16, round and square ... " 77 50
½ and 9-16, " " ... " 80 00
7-16, " " ... " 85 00
⅜, " " ... " 90 00
5-16, " " ... " 95 00
¼, " " ... " 100 00
3-16, " " ... " 127 50
Band Iron.
1 to 6 in. x 3-16 to No. 12 ... " 92 50
Horse Shoe Iron.
⅝ and ½ x ⅜, to ½ ... " } 167 50
1 x ⅜, to ⅝ ... " }
Ovals, Half Ovals and Half Rounds.
⅝ to 1⅛ ... ℘ ton, $ 97 50
⅝ and 11-16 ... " 102 50
½ and 9-16 ... " 107 50
7-16 ... "
⅜ ... "
Nail Rods
Best Norway ... ℘ lb 8½ @ 9c
Norway Shapes
½ to 2 in. x ½ to ⅝ ... ℘ lb } 8½c
¼ to ⅝ square ... " }
Norway Bar
⅝ to 2 in. square ...

Spring Steel 1 to 4 in. wide	"	7½c
Tire Steel ⅝ to 1⅛ x ½ and 5-16	"	8½c
⅞ & 1 x 3-16	"	9½c
⅞ & 1 x ¼	"	
Toe Calk Steel ½ to ⅝ x ⅜ to ½	"	7½c
Plow Steel 6 to 16 wide	"	8½c
Sleigh Shoe Steel ⅝ to 1¼ x ⅜ to ⅝		6½c
Hoops, ⅝ x No. 22	₩ ton	$155 00
" ⅝ x No. 20	"	180 00
" ⅝ x No. 19	"	125 00
" 1 and 1⅛ x No. 18	"	115 00
" 1¼ to 2 and 1x1¼ x No. 18 and 14	"	105 00
Scroll Iron—½ x 16	"	132 50
" ½ x 10	"	122 50
" ½ x 8-16	"	127 50
" ½ x ¼	"	122 50
" ⅝ x 14	"	132 50
" ⅝ x 12	"	120 00
" ⅝ x 10	"	117 50
" ⅝ x 8-16	"	115 00
" ⅝ x ¼	"	112 50
" ¾ x 14	"	115 00
" ¾ x 10	"	112 50
" ¾ x 8-16	"	110 00
" ¾ x ¼	"	107 50
" ⅞ x 14	"	
" ⅞ x 12	"	110 00
" ⅞ x 10	"	107 50
" ⅞ x 8-16	"	105 00
" ⅞ x ¼	"	102 50
" 1 x 14	"	120 00

Sheet Iron.

		Common English.	R. G. American.	R. G. English.
Nos. 10 to 20	₩ ₤	4½ @ 4¾c	5½c	6c
21 to 24	"	5 @ 5¼c	6c	6½c
25 to 26	"	5½c	6½c	6¾c
27	"	5¾c	6¾c	7c
28	"	6c	7c	7¼c
30	"	7¼c		
Galvanized, 10 to 20, prime	₩ ₤			11c
" 21 to 24	"			12c
" 25 to 26	"			14c
" 27	"			14c
Patent Polished	"			15c
Russia, Nos. 8 to 11	₩ ₤			19c
" Nos. 12 to 16	"			19c
" Stained, No. 1	"			17½c
Belgian	"			

One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON

4½	5	5½	6	7 inch.
$3·75	4·25	5·25	5·25	6·50 per doz.

RUSSIA IRON.

4½	5	5½	6	7 inch.
$8·00	10·00	13·00	13·00	14·00 per doz.

Adjustable Stove Pipe Elbows.

CHARCOAL IRON.

4	4½	5	5½	6	7 inch.
$3·25	3·75	4·25	4·75	5·25	6·25 per doz.

RUSSIA IRON.

4	4½	5	5½	6	7 inch.
$7·00	8·00	9·50	10·75	11·75	13·75 per doz.

Discount on orders of 10 doz. 5 %.
" " " 25 doz. 10 %.

Brass.

ROLLED AND IN SHEETS.
(Brown & Sharp's Gauge.*)
For the purchase of 100 pounds and over at one time

HIGH BRASS.

All Nos. to No. 28, and widths 14 in. and under	34c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in. inclusive	37c
Over 20 in. to 30 in. inclusive	40c

½c ₩ ₤ advance on each No. above No. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass at 53c
Sheets 24x48 in., and all sheets cut to particular sizes and lengths 40c
Platers' Rules 44c
Sheets wider than 30 in. and under 40 in. 44c
" 40 in. and over 46c
Circular sheets, in diam. from 4 in. to 14 inclusive 44c
" " over 14 in. to 20 " 47c
" " " 20 in. to 30 " 50c
" " " 30 in. to 40 " 53c
" " " 40 in. 56c
Brass Rods above No. 0, and under 1 in. 43c
" " 1 in. and over 47c

LOW BRASS.

4c ₩ ₤ more than High Brass.
Gilding Metals, 7c ₩ ₤ more than High Brass.
Platers' or Gold Metal { In Bars 46c / Sawed 49c

FOR SLITTING: Metal in Width.
2 in. to ¼ in., to No. 30, inclusive, 1c ₩ ₤ advance.
2 in. to ¼ in., thinner than No. 30, 2c ₩ ₤ advance.
2 in. to ⅜ in., " " 30, 3c " "
⅜ in. and less to No. 30, 2c ₩ ₤ advance.
⅜ in. and less thinner than No. 30, 5c ₩ ₤ advance.
10 % discount.

SCRAP—NEW METAL.

High Brass Scrap, 17 cents, net.
Low " 19 " "
Gilding, 21 cents, net.
Turnings, Filings and Chips, half the price of Scrap net.

BRASS AND COPPER WIRE.
(Stub's Wire Gauge).

	High Brass.	Low Brass.	Gild'g and Cop'r
Nos. 0 to 20	37	41	47
Nos. 21, 22, 23	38	42	48
Nos. 24 and 25	39	43	49

Brass Wire straightened and cut, 4 cents advance
10 % discount

FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gild'g and Cop'r
No. 26	0·41	0·45	0·51
No. 27	0·44	0·48	0·54
No. 28	0·46	0·50	0·56
No. 29	0·48	0·52	0·58
No. 30	0·50	0·54	0·62
No. 31	0·52	0·56	0·66
No. 32	0·56	0·60	0·71
No. 33	0·60	0·64	0·81
No. 34	0·64	0·68	0·91
No. 35	0·69	0·73	1·03
No. 36	0·78	0·82	1·15
No. 37	0·98	0·98	1·28
No. 38	1·28	1·23	1·58

Ten cents per pound extra for Spooling.

TUBING.
(Brown & Sharpe's Gauge.)

	₩ ₤
Plain to No. 20, inclusive	$0·52

Nos. 21, 22, 23, 2c. advance on List for each No.
Nos. 24, 25, 26, 4c. " " "
Above No. 26 special rates.

Plain Tube, 1-4 inch	68
" 3-16 "	1 88
" 1-8 "	1 78

All Mandrel-Drawn Tubes 5c. advance on List.
Fancy Tubing 4c. advance on List above Plain.
English, Scotch, and Extra Patterns Fancy Tubing to No. 20 61
Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
Add to two cents a half-cent for each additional cutting under two feet. 10 % discount.
BRASS DOOR RAIL—48 cents per lb.—10 % dis.

BELT AND HOSE COPPER RIVETS AND BURS.

Price per ₤	49	50	52	54	56	58	60	64	68c
Nos.	7	8	9	10	11	12	13	14	15

Braziers Rivets, 43 cents per pound discount 10 %.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire
4 per cent. 12 inch. to No. 26	0·75	0·90
6 " " "	0·95	1·00
10 " " "	1·05	1·25
15 " " "	1·20	1·55
18 " " "	1·45	1·75
20 " " "	1·55	

Discount 10 %.
German Silver Sheet over 12 inches wide and weighing more than 10 lbs. $2·10 ₩ ₤ net
Advance two cents for each additional inch in width above 12 inches, and two cents per pound on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers' at 50 cents per pound additional.
German Silver Scrap, one-third less than net price of 12 inch Market Metal; German Silver Turnings, Filings and Chips, half the price of Scrap.
* Brown & Sharp's Gauge is about two numbers finer than Stubs' Wire Gauge.

COPPER—DUTY: Pig, Bar and Ingot, 5c.; old copper, 4 cents ₩ ₤; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem. All subject to a reduction of 10 per cent.

American Ingot	₩ ₤	26 @ 26½c
English " "		

SHEATHING, BRAZIERS COPPER, BOLTS, &C.

Braziers Copper, ordinary sizes, over 16 oz., per square foot	35c ₩ ₤
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot	38c "
Braziers Copper, 12 oz. per square foot and lighter	41c. "
Circles less than 24 inch in diameter	38c. ₩ ₤
Circles, 8 24 inch diameter and over	41c. "
Segment and Pattern Sheets	38c. "
Locomotive Fire Box Sheets	35c. "
Sheathing Copper, over 12 oz. per sq. ft.	33c. "
" 12 oz. ₩ sq. ft. and lighter	41c. "
Bolt Copper	35c. "

No Copper in Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

TINNING.

14x48, by the case	8c. ₩ sheet
14x48, less than case	10c. "
Boiler Sizes, 7 and 8 inch	12c. "
9 inch	15c. "
Other sizes not larger than 30x60	2½c. ₩ sq.
Larger than 30x60	5c. "
Copper Bottoms, 34 @ 36c. ₩ ₤	net

O'NEILL'S PATENT PLANISHED COPPER.
14x48.

14 and 16 oz. and heavier	39c. By the case, 38c. ₩ ₤
12 oz. and lighter	42c. " " 41c. "

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60	
14 and 16 oz. and heavier	41c. By the case, 40c. ₩ ₤

(And all sizes not over 20 inches wide.)
30x60

14 and 16 oz. and heavier	43c. ₩ ₤
12 oz.	46c. "

LEAD—DUTY: Pig, $4 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb. All subject to a reduction of 10 per cent.

Spanish	6¾ @ 6¾c gold
German Refined	6¾ @ 6¾c gold
English	@ 7¼c gold
Bar	dis 10 % 9¾c.
Pipe	dis 10 % 9c.
Tin Lined Pipe	dis 10 % 10½c.
Sheet	dis 10 % 8c.
Shot	dis 10 % Drop, 9c.; Buck, 9¼c.

Solder No. 1. 18c. @ 19c. No. 2, 17c. @ 17½c.

STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3½ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as Steel.

American Cast Steel.

Tool	16c
Spring	12½c
Homogeneous	12½c
Tire	12½ @ 13½c
Machinery (round and square)	11½ @ 12c
File	12½c
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
Saw Plate, gang and X cut	13 @ 14c
" circular as to size	18 @ 80c

Chrome Steel.

Tool	₩ ₤ 20 @ 21c
Tool, extra fine	" 40 @ 75c
Spring	₩ ₤ 12c and upward
Machinery	₩ ₤ 14c.
Hammer	" 15c.
Gun or Homogeneous	" 16c

English Steel,—payable in gold, dis 5 % cash.

" Best Cast	₩ ₤	18c
" Extra Cast	"	19c
" Round Machinery, Cast	"	11½c
" Swaged, Cast	"	18c
" Best Double Shear	"	18c
" Blister, 1st quality	"	13½c
" " 2d quality	"	11½c
" " 3d quality	"	10½c
German Steel, Best	"	11½c
do 2d quality	"	10½c
Sheet Cast Steel, 1st quality	"	18c
" " 2d quality	"	16c
" " 3d quality	"	14c
File Steel, Flat and ½ Round	"	12½c
" Square and Round	"	13c
" Mill	"	13½c
" Taper to 4 inch	"	14c
" Taper 3 and 3½ inch	"	18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.

Silesian, cash	7½ @ 7¾c., gold
American "	5 @ 11c. currency
Banca	₩ ₤ 28½ @ 29c. gold
Straits	₩ ₤ 27c. gold
English	₩ ₤ 24½c. gold

CHARCOAL TIN PLATE.

I C 10x14, Prime Charcoal	12·25
12x12, "	12·75
14x20, "	13·00
I X 10x14, "	14·50
12x12, "	15·00
14x20, "	15·50
D C 12½x17 "	11·75
D X 12½x17 "	14·00
For each additional X add	2·25

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$11·50 @ 11·75	10·50 @ 10·75	9·50 @ 10·00
I C 12x12	12·00	11·25	
I C 14x20	12·25	11·25	

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$10·75 @ 11·00	9·75 @ 10·30	7·25 @ 9·75
I X 14x20	13·50		
I C 20x28	23·75	21·25 @ 23·25	16·75 @ 21·25
I X 20x28	28·25	27·25	
I C 20x28 ft.	24·75		

ZINC.—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet, 2½c. ₩ ₤. All subject to a reduction of 10 per cent.

Sheet	cask 9¾c
"	open 10c

Paper Stock, Old Metals, &c.

(Dealers' Selling Prices.)

Canvas linen	6 @
" cotton. No. 1	@ 6
" " No. 2	@ 3½
White linen rags, No. 1	@ 7¼
" " No. 2	@ 5½
Colored	2½ @
Mixed woolens	@ 3
Soft woolens	@ 6½
Gunny bagging	1½ @ 2
Jute Butts	2½ @ 2¾
Kentucky bagging	5¼ @ 5½
Book stock	4 @ 4½
Waste paper and scraps	1½ @ 3
Rope cuttings	1½ @ 3
Kentucky Bale rope	@ 4½
Oakum junk, No. 1	5½ @ 5¾
" No. 2	3½ @ 4
Grass rope	3¾ @ 4
Tarred Shaking	1¼ @ 1½
White Collar Cuttings, all paper	4 @ ..
" " " muslin lined	5 @ ..
" Envelope "	7 @ ..
Hard White Shavings, No. 1	6½ @ ..
Soft " " No. 1	6 @ ..
White Shavings, No. 2	5½ @ 6
Mixed Shavings, part white	4 @ 4½
Imperfections, No. 2, best folded sheets	5 @ ..
" " 1, Heavy Stock	4½ @ 5
Book Stock, Mixed	3½ @ 4
" " No. 2, light	2½ @ 3
Prints	1½ @ 2
Pure Manilas	2½ @ 2¾
Bogus Manilas and Hardwares	1½ @ 1¾
Commons	1 @ ..
Binders' Board Cuttings	1½ @ 2
Straw Board Cuttings	1¼ @ 1¾

Old Metals.

Copper	22 @ 23
Yellow metal	16 @ 17
Brass	16 @ 17
Heavy Composition	19 @ 20
Old lead, solid	6½
Tea lead	5¾
Wrought iron	1¾ @ 1¾
Sheet iron	0¾ @ ..
Cast iron	@ 1¾
Machinery iron	1¾ @ 1¾
Zinc	5¼
Pewter, No. 1	28 @ 24
" No. 2	10 @ 12
Spelter	

Paints, Oils, etc.

Paints.

Black, lamp—Coach Painters	₩ ₤ 30c
" " Ordinary	8c
" Ivory Drop, fair	15c
" " best	26c
Black Paint, in oil kegs, 8c.; asst'd cans, 11 c	
Blue, Prussian, fair to best	50 @ 75c
" " " in oil	35 @ 65c
" Chinese, dry	83c
" Ultamarine	25 @ 30c
Brown, Spanish	1¾c
" Van Dyke	9c
Carmine, 40	$12 00
Green, Chrome	15 @ 23c
" " in oil	18 @ 25c
" Paris good, 30c; best, 40c	
" " in oil " 30c; " 65c	
Mineral Paints	1¼ @ 4c
Orange Mineral	14½c
Red Lead, American	9½c
" English	10½c
" Venetian (N. C.) dry	2¾c
" " in oil asst'd cans, 11c; kegs, 8½c	
" Indian, dry	10c
Rose Pink	13c
Sienna, American, Raw	4c
" Burnt	4½c
" " in oil	16 @ 26c
" Raw "	15 @ 25c
Umber, Burnt	4 @ 8c
" " in oil	16 @ 21c
" Raw	3½ @ 7½c
" " in oil	16 @ 22c
Vermillion, Chinese	$1 62
" English	1 75
" Triese	1 62
" American, Common	23c
White Lead, American, pure dry	10½c
" " " in oil	11½c
White, Paris, English, prime in bbls. 2½ @ 2¾c	
Yellow Ochre French	2½ @ 2¾c
" in oil asst'd cans, 11c; Kegs, 8½c	
" Vermont in casks 1½c	
" Chrome	17 @ 21c
" in oil	18 @ 22c
Zinc White, American No. 1 dry	9c
" 1, in oil	11c
" French (Paris)	11 c
" " in oil	12

Oils.

Linseed Raw	₩ gal. casks, 97c. bbls. 98c.
" Boiled	" $1·02 " $1·03
Whale, Crude	" ..
" Bleached Winter	" ..
Sperm, Crude	" 1·50
" Winter unbleached	" 1.70
" Bleached	" 1·75
Seal, Extra Refined	"
Lard, Pure Winter	" 92c
" Spring	"
Cotton Seed, Crude	" 42½c
" Southern Yellow	46½c @ 47½c
" White	
Neatsfoot, Winter	70c @ $1·10
Natural Lubricating	38c @ 40c

Sundries.

Asphaltum	9c
Benzine	₩ gal. 18c
Chalk	1½c
" Block	
Dryer, Patent, Am'n asst'd cans, 10½c.; kegs, 9c	
" " English " 11c.; " 9c	
Flocks	
Frostings	50c
Glue, White	38 @ 47c
" Sheet	30c
Glaziers' Points, Zinc	9c
Gum, Copal	80c
" Damar	35c
" Shellac, English	60c
" " dark	56c
Litharge	10c
Pumice Stone, selected Lumps	4 @ 6c
" powdered	4c
Putty in bladders	9½c
" in bulk	3c
Rotton Stone, soft, English	40c
Spirits Turpentine	
Whiting, Spanish	1c

Glass.

French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 7 x 9	$8·00	$7·00	$6·75	$6·00
8 x 10 to 10 x 14	8·50	8·00	7·25	6·50
10 x 15 to 12 x 16	9·00	8·50	8·00	6·75
13 x 16 to 16 x 20	9·50	9·00	8·50	7·75
15 x 22 to 15 x 30	11·75	10·50	10·00	8·00
16 x 30 to 22 x 30	14·25	12·25	11·00	9·50
15 x 38 to 22 x 36	15·00	13·50	12·00	
24 x 36 to 24 x 40	15·75	14·25	12·50	
28 x 38 to 28 x 42	16·25	14·75	13·25	
28 x 44 to 28 x 50	17·25	15·75	14·25	
30 x 50 to 30 x 54	20·50	17·00	15·50	
32 x 54 to 34 x 56	21·50	19·25	17·50	
34 x 58 to 34 x 60	22·00	21·50	20·25	
36 x 60 to 40 x 60	26·50	24·25	23·00	

DOUBLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 7 x 9	$13·00	$12·00	$11·50	$10·00
8 x 10 to 10 x 14	14·00	12·75	12·00	10·75
10 x 15 to 12 x 16	15·00	14·00	13·25	11·25
13 x 16 to 16 x 20	16·00	15·00	14·00	12·50
15 x 22 to 15 x 30	20·00	17·50	16·50	13·25
16 x 30 to 22 x 30	22·00	19·25	17·75	15·00
15 x 38 to 22 x 36	23·75	20·50	19·25	
24 x 36 to 24 x 40	24·75	22·50	20·00	
28 x 38 to 28 x 42	26·00	23·50	21·00	
28 x 44 to 28 x 50	27·50	25·50	22·50	
30 x 50 to 30 x 54	31·00	26·50	24·00	
32 x 54 to 34 x 56	32·50	29·00	26·50	
34 x 58 to 34 x 60	34·50	33·00	31·00	
36 x 60 to 40 x 60	39·50	36·50	35·00	

Sizes above—$12·00 per box extra for every 5 inches. Discount to the trade, 50&10 to 50, 10&5 per cent.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

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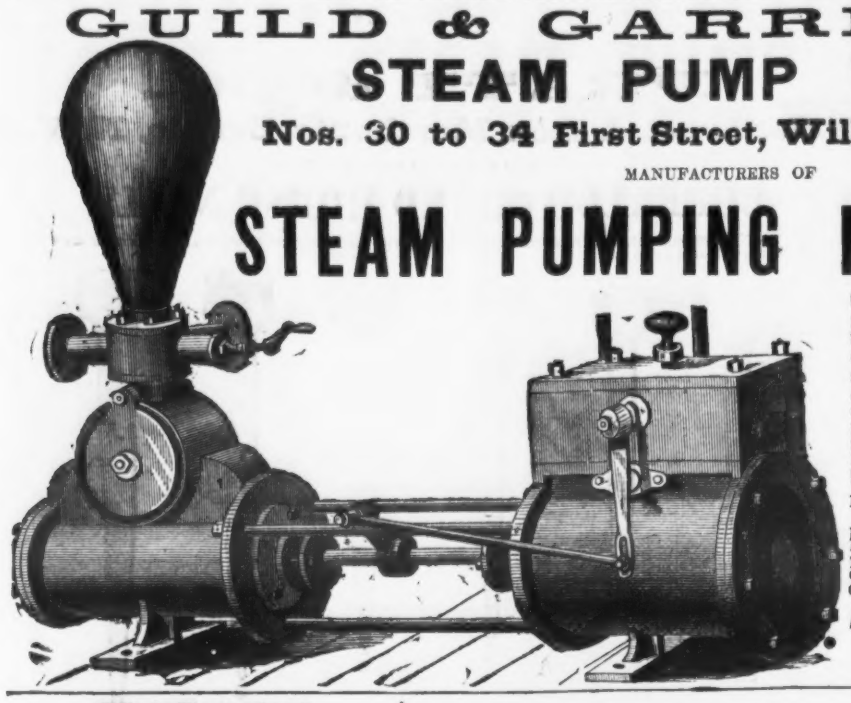

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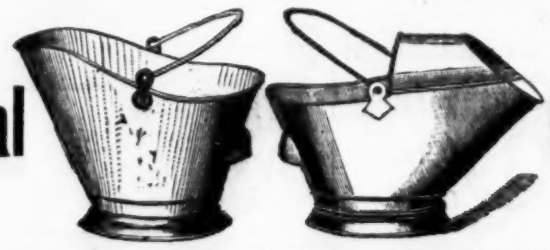
Coal  Hods.

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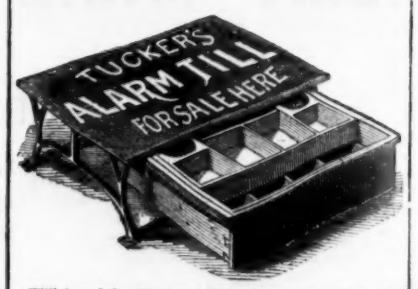

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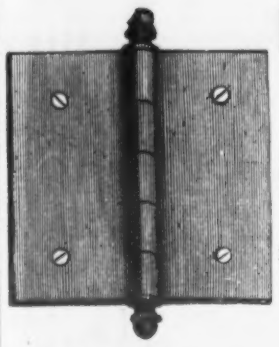

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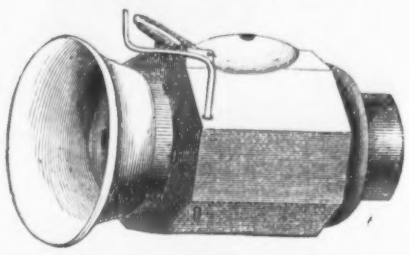

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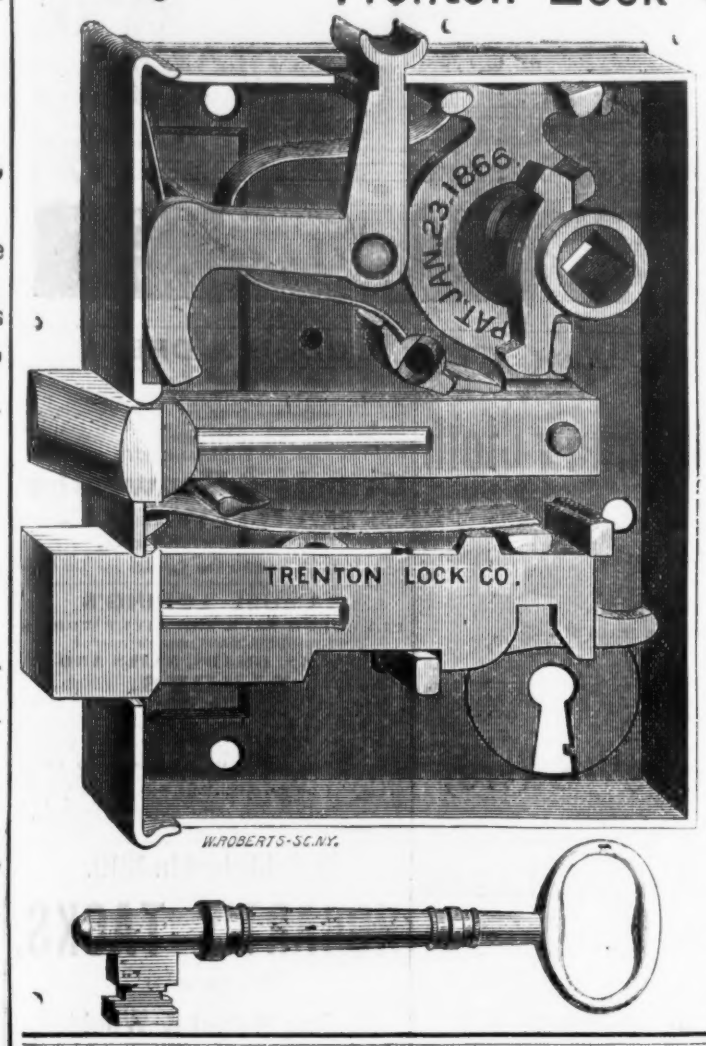

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Square Groove Brass Face and Wheel Pulleys, 2½ inch	"	7 50

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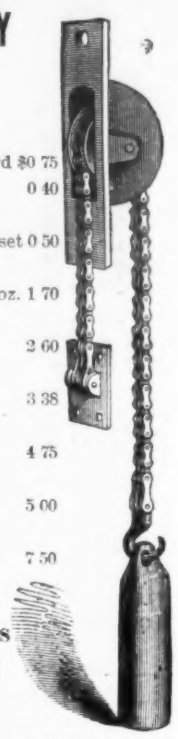

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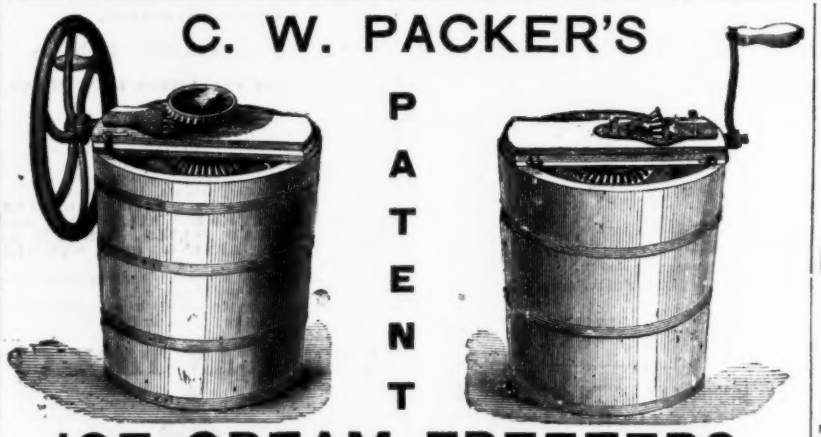

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DOUBLE ACTION FREEZER.
SIZES AND PRICES.

10 quarts	$15 00		
15 "	$20 00—With Fly Wheel	25 00	
25 "	25 00— " "	30 00	
35 "	with Fly Wheel	40 00	

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SIZES AND PRICES.

2 quarts	$3 50	8 quarts	$ 9 00
3 "	4 50	10 "	12 00
4 "	5 50	15 "	15 00
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Discount for 25 dozen lots........50c
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Bates' & Ives' Bits........dis 30&10 %
Douglass' Bits........dis 30&10 %
Hamden Auger Bits........dis 30&10 %
Cook s Bits........dis 40 %
Bonney's Pat. Hollow Augers........dis 25 %
Stearn's Patent Hollow Augers........dis 25 %
Russell Jennings' Bits........dis 10 %
Bates' & Ives Nut Augers........dis 30&10 %
Douglass Nut Augers........dis 30&10 %
Watrous' Ship Augers........dis 10 %
Balances.—Landers Frary & Clark's........dis 15 %
Chattillon's........dis 15 %
Morton's........dis 15 %
Common Spring, with Hook........₽ doz $1 38 @ 2 00
Bells.—Bevin Bros. Mfg Co. Full Weight Hand Bells........dis 50&10 @ 60 %
Bevin Bros. Mfg. Co., Extra Light Hand Bells........dis 60 @ 60&10 %
Other makers light........dis 60&10 %
Connell's Door Bells........dis 50 %
Great Western and Kentucky, Cow........dis 50&10 %
Boring Machines.—Bates' Mfg. Co., complete with augers........dis 15 @ 20 %
Douglas' Mfg. Co., complete with augers..dis 15 @ 20 %
Common Boring Machines, no Augers.....$4 25 @ 4 00
Anguiar, " "........5 25 @ 5 00
Bolts.—Eastern Carriage Bolts........dis 70&10 %
Western " "........dis 70&10 %
Philadelphia " "........dis 50&10 %
Wrought Shutter Bolts........dis 45 @ 50 %
Cast " "........dis 30&10 %
Skelly's Phila. Norway Iron, finish, points....dis 50&5 %
Braces.—Barber s........dis 40 %
Backus........dis 40&10 %
Bartholomew's American Ball........dis 10&10 %
Spoffard........dis 40 %
Butts.—Cast Fast Joint, Narrow........dis 50 %
" " Broad........dis 50 %
Cast Loose Joint........dis 60 %
" Acorn, Loose Pin........dis 45 %
Wrought Loose Pin........dis 35 %
" Table Hinges and Back Flaps........dis 30 %
" Narrow........dis 30 %
" Loose Joint........dis 35 %
" Reversible........dis 35 %
Parker's Blind Butts........
Shepard's " "........dis 15 %
Clark's " "........} dis by the case 50 %
Garretson's " "........
Lull & Porter's " "........dis 25&10 %
Cherritree Blind Butts for wood........dis 50 %
Chains.—German Halter........new gold list dis 10 %
" Coil........new gold list dis 10 %
Galvanized Pump........₽ ℔ 15c
Best Proof Coil Chain—
₽ ℔...... 13¼ 10¼ 10 9½ 9¼ 9 8½c gold
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅜ in.
By the cask, 560 lbs., discount ½c per lb. Common Chain, ½c per lb. less than proof.
Chisels.—Socket Framing........dis 60 @ 60&10 %
Socket Firmer........dis 60 @ 60&10 %
Tang "........dis 40 @ 40&10 %
Beaty's Framing and Firmer........dis 10 @ 15 %
Casters.—Porcelain Wheel........dis 25&10 %
Iron........dis 25&10 %
Brass........dis 25&10 %
Clothes Wringers.—Universal........per doz $72 00
Novelty........" 72 00
Reliance........" 72 00
Providence........" 72 00
Orders for 5 dozen, discount $3 per dozen.
King Wringers (Iron Frame)........per doz $68 00
Coffee Mills.—Common Box and Side........dis 10 @ 15 %
Patent Box and Side........dis 10 @ 15 %
Cutlery.—American Pocket (best)........dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices.
Drawing Knives.—Hart Mfg. Co. s ..dis 60 @ 60&10 %
Concave Adjustable Handle........dis 10 %
Beatty........dis 10 @ 15 %
Fry Pans.
Tinned........dis 20 %
₽ doz..$3·00 3·25 3·62 4·00 4·50 5·00 5·50 6·00 7·50
No..... 0 1 2 3 4 5 6 7 8
Burnished
₽ doz..$2·80 3·00 3·38 3·75 4·12 4·50 5·00 5·62 6·75
No.... 0 1 2 3 4 5 6 7 8
Files.
Nicholson Mill Files.... new list, $5 00 to £ cur dis 10 %
" Bastard........" 5 00 to £ cur dis 10 %
" Taper........" 5 00 to £ cur dis 10 %
Butcher's Mill........$5 75 to £ gold
" Bastard........5 50 to £ gold
Taper........5 50 to £ gold
Moss & Gamble—Mill, Taper and Bastard........5 50 @ 5 25 to £ gold
Fluting Machines.
Royal, No. 1, 4½ inch Rollers........list $6 00
" No. 2, 6 " "........list 7 00
K. F. M.—4½ in. rolls........5 00
" —6 in. rolls........6 00
Hammers.
Yerkes & Plumb's........dis 10 %
Hammond & Son's........dis 5 %
Verce........dis 5 %
Hatchets.
Beatty's........dis 10 @ 15 %
Shingling and Half. { ₽ doz...$7·00 7·50 7·75 8·00 / No...... 1 2 3 }
Yerkes & Plumb........dis 10 %
Shingling and Half. { ₽ doz...$7·00 7·50 8·00 8·50 / No...... 1 2 3 4 }
Claw.... { ₽ doz........$7·50 8·00 / No........ 1 2 3 }
Hinges.—Strap and T, advanced Feb. 6.....dis 25&7½ %
Bonney's No. 1 Gate........dis 25 %
" No. 2 and 3........dis 35 %
Horse Nails. Nos. 6 7 8 9 10
Ausable........ 27 25 24 23 22
Globe........ 28 26 25 24 23
Brundage........ 26 24 23 22 21
Nos. 5 6 7 8 9 10
Putnam........ 32 28 26 25 24 22
On Ausable, Globe and Brundage 1000 ℔ lots.....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination........new list dis 45 %
Extra discount for cash 2 %
Porcelain and Mineral........dis 20 %
Locks and Latches.—Rim and Mortise........dis 45 %
Extra discount for cash 2 %
Till and Cupboard........dis 25 %
American Padlocks........dis 50 %
Scandinavian Pad Locks.
₽ doz.......$10·50 10·50 12·00 12·00 15·00 15·00 } dis 15 %
No........ 9 9½ 10 10½ 11 11½
₽ doz.........$18·00 18·00 22·00 22·00 } dis 15 %
No........ 12 12½ 13 13½
Trunk Locks........dis 5 @ 10 %
Thumb and Roggens Latches........dis 25 %
Lanterns.—Square Candle and Oil........dis 10 %
Globe for Oil........dis 10 %
" " Kerosene........dis 10 %
Tubular Lanterns........dis 10 %
Mattocks.—Long and Short Cutter........dis 25 %
Western Pattern........dis 25 %
Pennsylvania Pattern........dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets........dis 20 %
Stebbins' Gates........dis 60 @ 60&10 %
Lincoln's "........dis 40 @ 40&10 %
Landers, Frary & Clark's Petroleum...dis 10 @ 10&10 %
Taylor's Petroleum Faucets........dis 20 @ 20&10 %
Brass Liquor Cocks........dis 20&10 %
Meat Cutters.—Dixon's........dis 10 %
Woodruff........dis 10 %
Stowe........dis 10 %
Hale's........dis 25 %
Stuffers........dis 10 %
Planes.—Auburn Tool Co., "Bench"........dis 30 %
Taber Plane Co., "Bench"........dis 30&10 %
Metallic Plane Co........dis 25&5 %
Evans Pat. Circular........net
Plane Irons.—American........list net
Butcher's........gold £, $5 50
Picks.—Philadelphia........net
Pittsburgh........net
Plumbs and Levels.
Stanley Rule and Level Co........dis 60 @ 60&10 %
Wm. Johnson, (Stanley List)........dis 60 @ 60&10 %
Rakes.—Cast Steel Garden........dis 33⅓ %
Malleable Garden........dis 33⅓ %
Wood Head Iron Teeth........dis 30 @ 40 %
Rules.—Stanley Rule and Level Co.....dis 60 @ 60&10 %
Steven's and Hubbard's........dis 60 @ 60&10 %
Steelyards.—American Pattern........dis 15 %
₽ doz.....$5·50 7·00 9·00 10·00 11·00 12·00
No........ 50 100 150 200 250 300
English Pattern........dis 15 %
₽ doz......$7·00 8·67 10·67 12·67 14·67 16·67
No........ 50 100 150 200 250 300
L. F. & C. Excelsior........dis 10 %
₽ doz........$9·00 10·00 12·00 15·00 18·00 21·00
No........ 50 100 150 200 250 300
Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened........₽ doz. $11·00 net
Clipper No. 10, Boxed and Sharpened........₽ doz $10·50
" " 5, " "........10·00
Common Scythes........₽ doz $7·00 @ 10·00
Squares.—Steel and Iron, new list........dis 50 %
Saws.—Disston's Cross Cut........dis 12½ %
Disston's Hand........dis 12½ %
W. McNiece's H'd. Cross-Cut & Circ'r, new list..dis 15 %
Boynton's Lightning, new list........dis 30 %
Shovels and Spades.
Rowland's Plain Back, list Feb. 1873........dis 20&10 %
" Back Strap "........dis 20&10 %
Oliver Ames & Sons........new list dis 12½ %
Brady Shovel Co........dis 12½&5 %
Sad Irons.—Richmond (polished face).....per lb. 4¼c.
Coquanock (polished face)........4¼c.
Stone.—Arkansas Oil, No. 1........₽ ℔ $1·78
Turkey Oil, No. 1........" 1·00
Washita Extra........" 30c
" No. 1........" 22c
" " 2........" 18c
Hindostan 8 in........" 5½c
" Axe........" 7c
Screws.—Iron........new list, Jan. 1st, 1874, dis 52½ %
Brass........dis 52½ %

Spoons.—
Plated Spoons, Rogers Bros.'...new list dis 30 @ 30&5 %
Britannia. Spoons........dis 40 @ 40&5 %
German Silver........new list dis 10 @ 15 %
" Light........new list dis 15&5 %
Lalance & Grosjean Iron........dis 10 %
Springs.—Gray's Door........dis 40 %
Torry's Door........dis 40 %
Stocks and Dies........dis 15 %
Stove Polish.—Gem........₽ gross, $5·00
Onyx........" $5·00
Try Squares.—Winterbottom........dis 10 @ 15 %
Stanley Rule and Level Co........dis 45&10 %
Willis Thrall, No. 2........dis 30&10 %
Disston's No. 2........dis 40 %
Tacks, &c.—Half Weight Tacks........dis 70 %
" " by the case.....dis 70&7½ %
Clout and Finishing Nails........7½ %
" " by the case........dis 7½ %
Traps.—Genuine Oneida—Newhouse list........dis 20 %
Imitation " " "........dis 30 %
Vises.—Solid Box........₽ ℔ net 15c
Wrenches.—Coes Genuine........dis 40 %
Coes Imitation Wrought Bar........dis 50 %
" " Malleable Bar........dis 60 %
" " (Kellogg) Malleable Bar.....dis 50 @ 10 %
Tafts Pattern (Wrought Bar)........65 %
" " Kellogg's (Nail Bar)........dis 65&10 %
Philadelphia Tool Co.'s Pat. Duplex........dis 25 %
" " " Improved Baxter........dis 25 %
" " " Adjustable Fork........dis 25 %
Wire.—No. 0 to 18........dis 35 @ 37½ %
No. 19 to 26........dis 40 @ 42½ %
No. 27 to 36........dis 45 @ 47½ %
Coppered 0 to 12........dis 15 @ 20 %
Tinned Broom Wire........dis 20 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

Feb 16, 1874.

Augers—C. S. Cut, French, Swift & Co........dis 30&10 %
Bits, Auger—Pierce s........dis 30 %
Snell Mfg. Co........dis 20 %
Jennings........dis 10 %
Bells, Cow—Yaw's Genuine........dis 25 %
Bolts—Carriage and Tire, Square Neck........dis 70&10 %
Diamond Neck........70&10&10 %
Braces—Bit, Spofford's Patent........dis 40 %
Brads, Cut........dis 50&7½ %
Boards—Stove, Brooks' Patent........dis 30 %
Butts—Brass........dis 25 %
Cast Loose Joint........dis 50 %
" " Pin........dis 45 %
" " " Japanned........dis 45 %
" " " Silver Tipped........dis 25 %
Wrought Narrow........dis 30 %
" Broad, Loose Joint........dis 35 %
" Table and Back Flaps........dis 30 %
Wrought Butts, Loose Pin........dis 35 %
Belting—Rubber........dis 30 @ 30&5 %
Leather new list........dis 30 @ 30&5 %
Beaters, Egg, "Peerless"........per doz $4·00
Brick—Bath (box of 2 doz) Best English........$1·50
" Rutherford "........$1·25
Chalk—White, Carpenter's........₽ gross, 50c
Red, Carpenter's........" 75c
Blue, "........" 90c
Chisels—Firmer Socket........dis 60&10 %
Framing Socket........dis 60&10 %
Corner Socket Chisels........dis 60&10 %
Slick's Carpenters'........dis 60&10 %
Castings—Malleable........dis 60&10 %
Cherry Seeders........₽ ℔ 10½c
Elbows—Corrugated........per doz $12 00
5 5½ 6 7
Charcoal........$4·25 5·25 5·25 6·50 } dis 15 %
Russia........10·00 13·00 13·00 14·00
Files—Wheeler, Madden & Clemson's........dis 45 %
Freezers Ice Cream—"Champion"........dis 33⅓ %
Gates—Molasses—
Patent Self-Measuring........₽ doz., $42 00; dis 20 %
Hinges—Window Blind—
Clark's No. 20........
Shepard's Standard, and Clark s........$1·50 per doz net
Wrought Strap and T........dis 50 %
Hods, Coal—Plain, Black and Galvanized........dis 25&7½ %
Funnel, Black and Galvanized........dis 10 %
Fancy and Helmet........dis 10 %
Palace Coal Vases........dis 10 %
Hammers—Maydole's........net
Yerkes & Plumb's........net
Hooks and Staples—Wrought........dis 5 @ 10 %
Hooks—Belt........dis 60&10 %
Hasps and Staples—Wrought........dis 50 %
Sad Irons........dis 60&10 %
Kettles—Brass........4¾c
Enameled........₽ ℔, 50 @ 5½c
Knives, Drawing—Oval No. 1........dis 40 %
Razor Blade........dis 60&10 %
Lanterns "Peerless,"....No. 1 5 10........dis 50&10 %
₽ doz $26 00 $11 25 $13 75 dis 10 %
Gem, with guards........
Tubular........$6 50
" with Guards........11 50
Machines—Apple Paring, "Reading."..$8·00 @ 8·50 ₽ doz
Mills, Coffee—Box and Slide, common........dis 15 %
Box Union and Eagle........dis 15 %
"Enterprise"........dis 20 %
Nails—Clout and Finishing........dis 7½ %
Shoe........dis 7½ %
Horse, Ausable.......No. 5 6 7 8 9 10
30 27 25 24 23 22c
" " Finished & Pointed........add 1c ₽ ℔
" " 1000 lbs........dis 5 %
" Clinton........No. 6 7 8 9 10
22 20 19 18 17c
Packing—Rubber........dis 30 @ 30&5 %
Pencils, Slate—Soapstone........4 5 6in.
Case lots........30 40 50c. ₽ 100
Paint—White Lead, U. S. Gov't........dis 20 %
Rivets—Iron, Black and Tinned........₽ ℔ 9 c
Copper........dis 20 @ 25 %
Rope—Manila, ½ inch and larger........dis 10 %
Rules—Boxwood and Ivory, Stephens........₽ ℔ 15¾c
Screws—"American Screw Co"—........dis 60 %
Flat Head, Iron........
Flat Head, Brass........dis 52½ %
Staples—Blind, Boardman s Pat., ⅜ & ⅝........dis 52½ %
Skates—White's........₽ ℔ 37c
Barney & Berry's—N. Y. Club Japanned Top........dis 25 %
" " B. & B. Club Blued Top........$2 20
Straps, Skate—Russet and Black........2 85
Spoons, Iron Tinned........dis 25 %
" by the case........dis 10 %
Plated Rogers' A No. 1........dis 20 %
Britannia........dis 30&5 %
Squares—Steel and Iron........dis 40 %
Shoes, Horse—H. Burden & Sons........new list 50 %
Shovels & Spades—Shepard, Forsyth & Dennison..₽ keg $5·50
Saws—Henry Disston & Sons........dis 20 %
Scales—Buffalo Scale Works........dis 10 %
Fairbanks........dis 25 %
Shears—Seymour's........dis 15 %
Traps, Steel—Newhouse........dis 60 %
Tacks—Half Weight Am. Iron........dis 20 %
Vises—Parallel, Buffalo........dis 70&7½ %
Wrenches—Coes' genuine........dis 15 %
Coes' Imitation........dis 40 %
Tafts' Pattern........dis 50&10 %
Ware—French, Tinned and Iron........dis 65&10 %
Stamped and Japanned........dis 30
Cast Iron Hollow........net
........dis 25 %
Tin Plates.—Add for each X........2·50

10x14, IC. Charcoal	$13·00	14x20 IC. terne	11·75 @ 12·00
12x12, "	13·50	20x28 C. "	25·50
13½x17, "	12·50	20x28 X. "	29·25
14x20, "	14·00		

Pig Tin—Straits........35c @ 36
Bar Tin........37c
Solder........No. 1, 20 c; No. 2, 18 c
Sheet Zinc—
"Lasalle"........570 ......600 ℔ casks
$10·00 10·30 ₽ 100 ℔s
Sheets........$10·00
Iron Wire—Bright and Annealed........dis 35 %
Coppered........dis 30 %
Tinned........dis 15 %
Tinned Broom, { Nos. 20 21 22 / 20c 21c 21c } ....dis 20 %
Copper—Sheathing 14 @ 18 oz........₽ ℔ 33c
Planished........₽ ℔ 39 @ 41c
Bottoms........₽ ℔ 35c
Bolts........₽ ℔ 35c
Braziers' Sheets........₽ ℔ 32c
Sheet Iron.—
18 Common........$5 50
21 Common........5 50
24 W. D. Wood & Co., Smooth Finish........6 10
Am. Russia........A. 14c B. 11c
Gen. Russia, No. 1 stained........20c
" " clean........21c
Galvanized........dis 15 %

PITTSBURGH.

Card Rates, 60 days.

Flat Bar —	1½ & 1⅜ x ⅜ to ⅜ in....3·5c
1½ to 4 x ⅜ to 1 inch..3·3c	1 & 1⅛ x ⅜ to ⅜ in....3·6c
4½ to 6 x ⅜ to 1 inch..3·5c	⅝, ¾ & ⅞ x ⅜ to ⅝ in..3·7c
1½ to 6 x 1⅛ to 1½ in..3·7c	
Horse Shoes.—	Nail rods........7·2c
All sizes........4·8c	
Heavy Bands —	⅞ to 1½ x ¼ & 5-16 in...4·3c
3½ to 6 x ¼ & 5-16 in..3·9c	½ to ¾ x ¼ & 5-16 in....4·5c
1½ to 3¼ x ¼ & 5-16 in..4·0c	
Light Bands.—	
3 to 6 x 3-16 to No. 12..4·3c	1 to 1⅜ x 3-16 to No. 12..5·0c
1½ to 2⅞ x 3-16 to No. 12........4·5c	½ to ⅞ x 3-16 to No. 12..5·5c
Hoops.—2½ to 3 in........4·6c	1 in........5·8c
3¼ to 4½ in........4·8c	⅞ in........6·3c
1⅞ to 2 in........4·8c	¾ in........6·8c
1⅝ to 1 11-16 in........5·1c	⅝ in........7·3c
1⅜ & 1¼ in........5·4c	½ in........7·8c

Round and Square.—	
1 to 1⅜ in........3·8c	⅜ to 7-16........4·0c
2 to 2⅞ in........3·6c	⅜ in........4·1c
3 to 3½ in........3·8c	5-16 in........4·5c
3¾ to 4 in........4·3c	¼ in........5·9c
⅝ to 9-16 in........3·7c	3-16 in........6·9c
Oval Iron.—	
¾ to 1¼ in........3·9c	½ in........4·3c
⅝ to ¾ in........4·1c	⅜ in........4·9c
Half Oval and Half Round.—	
¾ to 1¼ in........4·2c	½ in........5·4c
⅝ to ¾ in........4·7c	⅜ in........6·9c

	Bolted.	Charcoal.	Jun.
Sheet Iron, 10 to 14	5·3	6·8	8·3
" 15 to 20	5·5	7·0	8·5
" 21 to 24	5·7	7·2	8·7
" 25 to 26	5·9	7·4	8·9
" 27	6·1	7·6	9·1

All sheets over 28 in. wide, ½c. ₽ ℔ extra.

Tank Iron —	Heads flanging........9·0c
3-16, ¼ & ⅜ in. thick..5·3c	Plow Slabs........5·9c
Boiler Plate Iron.....8·0c	Plow Wings........6·4c
Heads not flanging....6·2c	
Railroad Iron—Countersunk and Punched.—	
1¼ x ⅜, 7-16 & ½ in...4·3c	1½, 1¾ & 2 x ½ & ⅜ in..3·8c
1¼ x ¼ & 5-16 in.......3·8c	1½ x ⅜ in........4·0c
Extras for Cutting to Length.—	
Flat bars and rounds and squares........0·1c	Light bands and wagon box iron........0·2c
Flat bars for tire......0·1c	Hoops........0·3c

The following are the Card rates of Lewis, Oliver & Phillips:
Iron, standard list, assorted sizes, for large orders, 3·3c, card rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk..4·7c ₽ ℔ net
Iron Wedges........5c ₽ ℔ net
Norway Nail Rods........9½c ₽ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point)........6 c ₽ ℔ net
Beetle Rings........9½c ₽ ℔ net
Fence Pickets—
⅜ round, bent to shape.30c ₽ ft. of fence, less 5 % off net
Discount off Standard List.
Carriage and Tire Bolts (new list)........70&5 % off net
Plow Bolts........30&5 % off net
Stove Bolts........5 % off net
Machine and Square Head Bolts........30 % off net
Coach and Lag Screws........30 % off net
Bolt Ends........25 % off net
Harrow Teeth, in lots of 1 ton or more, packed in casks, 1 in. diam. 3¾c ₽ ℔ net; ⅞, ¾ in. diam. 3⅞c ₽ ℔ net; ⅝ in. diam. 4⅛c ₽ ℔ net.
Patent Headed Harrow Teeth, packed in casks, ½c ₽ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅜ in. diam. 7c ₽ ℔ net; 9-16 in. diam. 8c ₽ ℔ net; ½ in. diam. 9c ₽ ℔ net. 1c ₽ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinges, ¾ to 1 in. diam. 9½c ₽ ℔ net; ⅝ in. diam. 10½c ₽ ℔ net; ½ in. diam. 12½c ₽ ℔ net.
Screw and Strap Hinges, in lots of 100 pairs or more, 14 to 36 in. long, 6c ₽ ℔ net; 8, 10 & 12 in. long, 7½c ₽ ℔ net.
Strap and T Hinges..40 % off net, delivered as customary
Screw Hitching Rings........$5 50 ₽ 100 net
Duck Nest Tuyere Irons........$15 00 ₽ doz net
Cast Iron Washers........₽ ℔ 4½c net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long........₽ ℔ 4½c net
1 to 2 in. diam. from 4 to 8 ft. long........" 4¾c net
1 to 2 in. diam. from 1½ to 4 ft. long........" 5½c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long........" 5¾c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long........" 6¼c net

WAGON HARDWARE.

Wagon Box Strap Bolts—
10 in. long by 7-16 at Screw End, ₽ set of 8 bolts..55c
12 " ½ " " 8 " ..70c
10 " 9-16 " " 8 " ..} 90c
12 " 9-16 " " 8 " ..}
14 " 9-16 " " 8 " ..$1 00
10 in. long by ⅝ at Screw End, ₽ set of 8 bolts..} 1 00
12 " ⅝ " " 8 " ..}
14 " ⅝ " " 8 " ..1 10
16 " ⅝ " " 8 " ..1 20
5c ₽ set for each additional inch over 14 in. All lengths made.
Wagon Box Rods, narrow track, each........18c
" " wide track, each........20c
Single Tree Irons, ₽ set of four pieces........38c
Wrought Iron Bolster Plates, 2¾ in. wide, ₽ set........60c
" " 3 " "........65c
" " 3¼ " "........70c
" " 3½ " "........75c
Wagon Brake Ratchets, each........16½c
" " " finished with guard, each..45 c
Wrought Hammer Straps, heavy pattern, each........16 c
" " " light " each........13½c
" Rub Irons, each........11 c
Stay Chain Hooks, each........8 c
Double and Single Tree Clips, figure 1, each........9 c
" " " " 2, each........10 c
" " " " 3, each........12 c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 100 sets........dis 25 %
Wagon Box Staples 1½ to 2½ in. to clinch. ₽ 1000 $12 50 net
" " Box Iron, to rivet on. ₽ 1000 8 50 net
Neck Yoke Eyes, each........5½c net
" " with ⅜ rings, each........8 c net
King Bolts, ⅞, 1, 1⅛, and 1¼ in. diam........₽ ℔ 4¾c net
Wagon Rivets, ex. large, flat, oval and steeple head, ½ in. diam. all lengths........" 9 c net
Wagon Rivets, 3-16 in. diam., all lengths........" 11 c net
" & Nails, in 5 ℔ paper boxes....₽ ℔ 1c extra
" " in 25 ℔ wood "....." ½c extra
Wagon and Hinge Nails, ¼ in........₽ ℔ 17 c net
" " " 3-16 in........" 19 c net
Double Tree Plates........}
Coupling "........} " 9 c net
Tongue "........}
Neck Yoke Plates........" 12 c net
Tongue Cap Iron, 1¾, 2 & 2¼ in. wide, same price ₽ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue, 5-16 in, ₽ ℔ 11½c net ¼ in., 12½c. net

DETROIT.

(Reported by Messrs. Jewett & Root.)

Tin Plate.—Best Charcoal	**Copper.**—
IC, 10x14........$13 00	Sheathing........33c
IX, 10x14........15 75	Copper Bottoms........36c
XX, 10x14........18 50	**Planished Copper.**—
IC, 12x12........13 50	Sheathing, 14x48........41c
IX, 12x12........16 25	Boiler Size, No. 7........43c
IC, 14x20........14 00	" " No. 8........43c
IX, 14x20........16 75	" " No. 9........43c
XX, 14x20........19 50	**Pig Tin.**—Large Pigs..35c
XXX, 14x20........22 25	Small Pigs........36c
XXXX, 14x20........25 00	Bars........37c
DC, 100 Plate........12 50	**Solder.**—No. 1........18c
DX, "........15 25	No. 2........20c
DXX, "........18 00	**Bright Wire**........dis 35 %
DXXX "........20 75	**Sheet Iron.**—
DXXXX 100 Plate..23 50	No. 18 Am. Com........5 50
IX, 14x14........25 00	No. 24 Am. Com........5 50
IC, 10x14 W........12 50	Pat. Am. Russia "A,"
IX, 10x14 W........15 25	Nos. 24, 25 & 26........c
Roofing Tin.—Best Char.	Pat. Planished Russia..c
IC, Terne, 14x20........$12 25	Russia No. 9, 10, 11&12...c
IX, " 14x20........15 00	W. D. WOOD'S & CO.'S SHEET IRON.—
IC, Terne, 20x28........26 00	Nos. 15 to 20 Smooth $6 10
IX, " 20x28........30 50	" 21 to 24........6 30
Coke Tin.—	" 25 & 26........6 50
IC, 10x14 Coke........$11 00	" 21 to 24 Char'l..7 80
IX, 10x14, Coke........13 75	" 25 & 26 "..8 00
IC, 14x20, "........12 00	

Sheet Zinc.—Any width........10 c

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal........$12·00 @ 14·00
I. X. 10x14 Charcoal........15·50 @ 17·00
I. C. Terne 14x20........11·00 @ 12·50
I. C. Terne 20x28........24·00 @ 25·50
I. C. Continuous........28·00

Block Tin.—	Bars........₽ ℔ 39c
Pigs........37½c @ 38c	
Solder.—	A 1........₽ ℔ 24c
S. & Co........₽ ℔ 28c	Roofing........" 22c
Lead.—Pig..₽ ℔, 7¼c @ 8c.	Bar........₽ ℔ 8c @ 9c
Copper.—	
Ingot........₽ ℔ —	Sheets, 6 to 9 lb...₽ ℔ 41c
Planished..." @ 40c	" 10 to 12 lb..." 33c
Sheathing..." @ 35c	Braziers 13 lb........" 35c
Copper Drops 37c @ 38c	Copper Bottoms..." —

Zinc.—Cask, 500 to 1000 lbs........₽ ℔ 11 c
Case, 100 lbs........" 11¼c
Slab........" 8½c @ 9c

Brass.—	Roll, No. 38 to 40...₽ ℔ 50c
Roll, No. 6 to 30. ₽ ℔ 45c	Wire, No. 0 to 20...₽ ℔ 50c
" 30 to 38. " 65c	" 20 to 25..." 60c
Babbit Metal.—	Black Lead........₽ ℔ 25c
Sellew & Co........₽ ℔ 85c	Market........" 15c

Antimony........₽ ℔ 20c
Bismuth........₽ ℔ $6 00
Nickel........₽ ℔ $3 50

Sheet Iron.—	Am Russia A..₽ ℔ 14 @ 15c
Russia........₽ ℔ 20c @ 22c	" " B.." 13 @ 14c

	Smooth Com. B.	Smooth Fin. S. I. U.	Smooth D Re'fd.
15 to 20	6·0c	7·5c	9·0c
22 to 24	6·2c	7·3c	9·2c
26	6·4c	8·0c	9·4c
27	6·6c	9·2c	9·6c

Galvanized Iron.—Full bundles........dis 25 %

Nos. 18 to 20........15c	No. 27........18c
22 to 24........16c	28........20c
25 to 26........17c	

Bar Steel.—Silver, ₽ ℔ 21c; Crescent, 17½c.
Iron Wire........dis 25 %
Enameled Ware........dis 33⅓ %
One Piece Corrugated Elbows........dis 10 %
Iron Gas Pipe........dis 65 %

Charcoal Iron.	Russia Iron.
4½ inch........₽ doz $3·75	4½ inch........₽ doz $8·00
5 "........" 4·25	5 "........" 10·00
5½ "........" 5·25	5½ "........" 13·00
6 "........" 5·25	6 "........" 13·00
7 "........" 6·50	7 "........" 14·00

Leader Elbows—Flat Crimp Retinned.—

₽ doz.	
2-inch........$2 00	2½-inch........$2 25
3-inch........2 50	3½-inch........3 00
4-inch........3 50	4½-inch........4 00

Sheet Iron Bread Pans........₽ ℔ 12c
American Broilers........₽ doz, $13·50
Tinmen's Machines........net list
Sad Irons........₽ ℔, 5¼c
Brass Kettles.—Ansonia........48c

Steel.

THREE 1st CLASS PRIZE MEDALS. CLASSES 1, 21, 22, Great Exhibition of Industry, LONDON, 1851.

MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS 1A UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

COCKER BROTHERS,

SUCCESSORS TO

SAML. COCKER & SON,

(Established 1752.)

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CAST, [illegible], SHEET, AND BLISTER STEEL, OF EVERY DESCRIPTION.

BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES; Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS, HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS, FISH HOOKS, NEEDLES. &c.

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AND IMPORTERS OF IRON

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CHICAGO, Crerar, Adams & Co.....NEW ORLEANS, Folger & Co.
CINCINNATI, Augustus Wessel.....SAN FRANCISCO, Huntington, Hopkins & Co.

F. W. MOSS,

Successor to JOSHUA MOSS & GAMBLE BROS.

FRANKLIN WORKS, WADSLEY BRIDGE WORKS, WALKLEY WORKS, } SHEFFIELD, ENGLAND.

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MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,

Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.

WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel. Also, manufacturer of

Sheet Cast Steel, Shear, German, Round Machinery, Hammer, Fork and Shovel Steel

And GENERAL MERCHANT.

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BARROW HÆMATITE STEEL COMPANY,

LIMITED.

BARROW IN FURNESS, LANCASHIRE, ENGLAND.

MANUFACTURERS OF

Steel Rails, Tyres, Wheels,

Axles, Shafting, Boiler & Ship Plates, Bessemer Pig Iron, etc., etc.

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STEEL

For Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for SPRINGS AND STAMPING COLD;

ALSO THE CELEBRATED

DOG BRAND FILES,

Unsurpassed, if equaled in quality.

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Steel.

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(LIMITED)

MANUFACTURERS OF THE

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Warranted Most Superior for Tools and Granite Rock Drills.

DARNALL WORKS, ATTERCLIFFE FORGE, WEST STREET WORKS, } SHEFFIELD, ENGLAND.

IMPORTERS OF FILES,

AND

AGENTS FOR ARMITAGE'S GENUINE MOUSEHOLE ANVILS.

NEW YORK, Edward Frith, 16 Cliff.
BOSTON, H. L. Richards, 18 Batterymarch.
PHILADELPHIA, Wm. H. Sowers.
CLEVELAND, O., Cleveland, Brown & Co.
NEW ORLEANS, Rich'd Rhodes, 71 Camp.
BALTIMORE, Md., Wm. H. Cole.
MONTREAL, Saint Paul St.
NEW HAVEN, Ct., Atwater, Wheeler & Co.

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Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

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Cast and Double Shear STEEL,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

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Office of S. & C. WARDLOW, 13 Gold Street, New York.

In calling the attention of consumers of Steel in any of the parishes above enumerated, we would respectfully assure them of our ability to supply an article that cannot be excelled in quality, temper, and adaptation in all respects to the purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class material in quality, temper, and durability is needed

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Manufacturers of all descriptions of

STEEL.

Bailey Street and Broad Lane Steel Works, } SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

ALSO STEEL of superior quality for Turning Tools, Taps, Dies, Drills, &c.

Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.

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Railroad Iron, Pig Iron, Merchant and Ship Iron,

AGENCIES IN BOSTON AND PHILADELPHIA.

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Hammered and Rolled STEEL of every description

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Steel.

Sheffield Steel Works.

(Established in 1848.)

SINGER, NIMICK & CO.

Pittsburgh, Pa.,

Manufacturers of Extra Quality Tool

CAST STEEL,

Patent Rolled

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All descriptions of Cast and German

Spring and Plow Steel,

Elliptic and Side Springs, Seat Springs,

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators,

Reaper Bars, ow Bars, &c., &c.

Warehouse, 83 Water and 100 First Streets.

ISAAC JENKS & SONS,

Minerva & Beaver Iron & Steel Works

Wolverhampton, England,

MANUFACTURERS OF

"Jenks" Spring Steel, Cast and Swedes Spring Steel,

TIRE, TOE CORK, SLEIGH SHOE, BLISTER & PLOW STEEL.

Also, Plow and other Iron.

VAN WART & McCOY, Agents,

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A full assortment of "Jenks" Spring Steel in stock.

MILLER, BARR & PARKIN,

Orescent Steel Works,

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Manufacturers of all descriptions of

STEEL

EQUAL TO ANY IN THE MARKET.

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ESTABLISHED IN 1801,

Have maintained their great reputation for [illegible] years. Manufacture the

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LAFLIN & RAND POWDER CO.,

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The superiority is well known of our brands Rifle Powder:

Orange Rifle, Orange Ducking, Lightning, Audubon.

SAFETY-FUSE at wholesale.

CHICAGO.

(Reported by Markley, Alling & Co.)

Agricultural Implements.—
Scythes—Dunn Edge Tool Co.....dis 30 %
Hay and Manure Forks—Otsego extra C. S.....dis 30 %
Hoes and Garden Rakes—Jackson and Otsego....dis 30 %
Scythe Stones.....dis 25 %
Scythe and Bush Snathes.....dis 25 %
Harvest Rakes and Barley Forks.....dis 25 %
Revolving Horse Rakes.....dis 25 %
Handles—Fork and Shovel.....dis 25 %
Cradles—Nithington, Cooley & Co.....dis 25 %
—Genuine Morgan.....₩ doz net $34 00

Augers and Bits.—
Ives' extra C. S....dis 30 % | Snell's.....dis 10 %
Jennings'.....dis 5 % | " Car Bits.....dis 10 %
Cook's.....dis 30 %

Axes.—Amoskeag Yankee.....₩ doz $13 50
Amoskeag Crescent..... " 14 00
Hunt's Yankee..... " 14 00
Kennebeck Yankee..... " 12 00
Lippincott " ..... " 13 00
" Crown..... " 14 00
" Beveled..... " 14 50
Jefford's Silver Steel..... " 13 00
Red Warrior, Beveled..... " 14 00
Kennebeck, Handled..... " 15 00
Boy's, Handled..... " 12 00

Bolts.—Carriage and Tire.....dis 25 %
Cast Barrel and Shutter.....dis 20&10 %
Wrought Iron Barrel.....add 10 %
" " Square.....net list

Butts.—Cast Fast Joint, Narrow.....dis 30 %
Cast Fast Joint, Broad.....dis 20 %
" Loose Joint.....dis 35 %
" " Pin, Reversible.....dis 35 %
" " Japanned.....dis 35 %
" " Silver Tipped.....dis 35 %
Wrought Narrow, Fast Joint.....dis 30 %
" Broad " " .....dis 30 %
" " Loose " .....dis 30 %
" Loose Pin.....dis 30 %
" Table.....dis 30 %
" Brass.....dis 10 %
Garretson's Blind Butts, Wood.....doz sets $1 75
" " Brick.....doz sets 2 75
Parker's " Wood.....doz sets 1 85
" " Brick.....doz sets 2 75

Casters.—Iron Plate.....dis 25 %
Brass Wheel Plate.....dis 25 %
Porcelain Wheel Plate.....dis 25 %
" " Bed.....dis 25 %
Iron Wheel Bed.....dis 25 %

Chisels.—Butcher's Tanged Firmer.....dis 30 %
" Long Paring.....dis 30 %
Witherby Socket Framing.....dis 50&20 %
" " Firmer.....dis 50&20 %
" " Corner.....dis 50&20 %
" " Slicks.....dis 50&20 %

Coffee Mills.
Box 4 Iron.....$ 3 75 | Box 85 Cast Steel.....$12 00
" 103 " ..... 5 25 | Slide 50.....4 75
" 102 " ..... 6 25 | " 60.....5 75
" 107 Britannia... 7 50 | " 70.....7 25
" 106 " ..... 8 50 | " 80.....18 00
" 25 Union..... 10 50 | " 15 Union.....7 00
" 35 " ..... 14 00 | " 30 " 8 00
" 75 Cast Steel.. 10 50

Cutlery.—American Table.....dis 20 %
" Pocket.....dis 25 %

Door Springs.—Torry.....₩ doz $5 50
Rubber..... " 4 00
Boon's..... " 5 00

Drawing Knives.—Witherby Tool Co....dis 50&20 %
Ohio Tool Co.....net list

Files.—Butcher's.....$7 00 ₤
Nicholson's.....$5 00 @ $5 50 ₤

Hammers.—
Maydole's.....net list | Yerks & Plumb.....net list
| Cheney.....net list

Handles.
Extra Axe...₩ doz. $3 00 | Coal Pick, No. 1..₩ doz $2 00
No. 1 Axe.... " 2 25 | Sledge, No. 1.... " 2 00
No. 2 Axe.... " 2 00 | Hatchet..... " 65
R.R. Pick, No. 1 " 2 00 | Hammer, A. E... " 65

Hatchets.—
| 1 | 2 | 3
Amoskeag Shingling.....$7 25 | $8 00 | $8 75
" Claw..... 7 75 | 8 50 | 9 25
" Lath..... 7 50 | 8 25 |
" " Solid Steel..... 12 00

Hinges.—Strap and T.....dis 25&7½ %
Screw Hook and Strap, 6 to 12 in.....net, 9c. ₩ lb
" " 14 to 24 in.....net, 7½c. ₩ lb
Hook and Eye Hinges.....net 12c. @ 16c. ₩ lb
Gate, No. 35, State.....₩ doz $3 50
" No. 3, In and Out..... " 8 50
" Blinn's Pat..... " 7 50

Horse Nails.—Northwestern, 8d.....24c
Ausable, 8d.....24c
Globe, 8d.....26c

Kettles.—Brass.....50c | Enameled.....dis 15 %

Locks and Knobs.—
Norwalk Lock Co. dis | EagleLock Co.....dis 15 %
Branford " . dis | Am. Pad Locks.....dis 25 %
| Conti'al Lock Co....dis 10 %
| Woodruff Patent...net list
Meat Cutters.— | Stowe's Sausage
Raven's Patent...net list | Stuffers.....net list
Hale's " ...dis 10 % | Enterprise Patent...dis 5 %

Molasses Gates.—
Stebbin's Patent..dis 50 %

Nails.—10d to 60d.....per keg $4 25 @ 4 37½

Oil Stones.—Washita No. 1.....net 30c ₩ lb
Washita Slips.....net 60c "
Hindostan No. 1.....net 9c "
" Axe.....net 10c "
" Slips.....net 15c "

Picks and Mattocks.—Picks, Railroad, Axe Finish.....₩ doz $12 00
Picks, Coal, Axe Finish..... " 10 00
Mattocks, L. C., Axe Finish..... " 15 00
" S. C., " " " 14 50
Grub Hoes, Axe Finish, No. 2..... " 9 00

Planes.—Ohio Tool Co., Beach.....dis 25 %
Sciota.....dis 30 %
A. Howland & Co., Bench.....dis 25 %
" Fancy.....dis 25 %
Bailey Patent Iron.....dis 15 %
Plane Irons, Butcher's.....dis 30 %

Rivets.—Iron..dis 10 @ 15 % | Copper, No. 7 net, ₩ lb, 55c
Tinned.....dis 10 @ 15 %

Rules.—Stanley Rule and Level Co.....dis 50&10 %
Hubbard & Curtiss Mfg. Co.....dis 50&10 %

Sad Irons.—Best A No. 1..... ₩ lb, 4c
" Copper Face Star..... ₩ lb, 4½c

Sandpaper.
Baeder & Adamson's No. 0 to 1½.....per ream, net $4 50
" " No. 2 to 3..... " net 5 00
Wiggin & Stevens, No. 0 to 1½.....₩ ream, net, $4 50
" " No. 2 to 3..... " " 5 00

Sash Locks.—Champion.....₩ gross, net, $12 00
Hopkins & Dickinson.....dis 10 %
Judd's Patent.....dis 10 %
Corbin's Patent.....dis 10 %
Clark's Patent.....dis 30 %

Saws.—H. Disston & Sons.....dis 10 %
Champion X Cut.....₩ foot, net, 60c
M. A. & Co. X Cut..... " " 50c
Lightning Cut..... " " 66c

Screws.—American Screw Co.—Iron...new list dis 50 %
American Screw Co.—Brass.....dis 50 %

Shovels and Spades.
Ames' Black Shovels.....₩ doz $14 50
" Polished " ..... " 15 50
" Patent " ..... " 18 00
Alling " ..... " 16 00
" " Molders'..... " 18 00
Crane's Black " ..... " 11 50
" Polished " ..... " 12 00
Smith's " " B. S. L. H. Rd. Pt.... " 13 50
" " " B. S. D. H. Rd. Pt.... " 14 00
Ames' Black Spades..... " 16 00
" Polished " ..... " 17 00
" Patent " ..... " 17 50
Alling " ..... " 16 00
Crane's Black " ..... " 12 50
" Polish'd " ..... " 13 50

Scoops.—Alling Steel Polished, No. 2....₩ doz, $13 50
Alling Steeled Polished, No. 3..... " 14 00
" " No. 4..... " 14 50
" " No. 5..... " 15 50
" " No. 6..... " 16 50
" " No. 7..... " 17 50
" " No. 8..... " 18 50
" " No. 10..... " 21 50
Crane's Polished, No. 5..... " 13 50
" No. 6..... " 14 50
" No. 7..... " 15 50
" No. 8..... " 16 50
Crane's Black Coal, No. 4..... " 17 50
" " No. 5..... " 18 00
Preston, Black Scoops No. 1..... " 12 00
" " No. 2..... " 12 50
" " No. 3..... " 13 00
" Half Pol. Scoops No. 1..... " 12 50
" " No. 2..... " 13 50
" " No. 3..... " 14 50
Lippincott, Half Pol. No. 2..... " 15 00
" " No. 3..... " 16 00

Wrenches.—Taft's.....dis 60 %
Coe's Imitation.....dis 50 %
Coe's Genuine.....dis 30 %

Wringers.—Novelty Clothes Wringer.....₩ doz $69 00
Universal Clothes Wringer..... " 72 00

Chicago Metal Market.

(Reported by Cragin Bros. & Chandler, 141, 143, and 145 Lake St.)

Tin Plate.—
IC, 20x14, Coke.....$12 50
IC, 10x14, Charcoal.. 13 50
IX, 10x14 " .. 16 50
IC, 12x12, " .. 14 00
IX, 14x12, " .. 17 00
IC, 14x20, " .. 14 50
IX 14x20, " .. 17 50
IC, 14x20, Coke Roofing..... 20 00
IC, 10x20 Coke, for Gutters..... 15 00
IC, 14x20, Charcoal Roofing..... 16 00
IX, 14x20 " 18 00
IC, 20x28, " 26 00
IX, 20x28, " 31 00

Pig Tin.—
Large, 60 lb..... .33c | Small, 30 lb..... .32c
| Bar Tin..... .30c

Zinc.—
In casks 1000 lbs..... c | In sheets..... .11 c
" 500 " .....10 c | Slab..... .9c

Copper.—Copper Bottoms..... .37c
Sheathing Copper..... .36c
Planished Copper..... .41c
" " cut to lengths..... .43c

Brazier's Sheets, 30x60.—6 to 8 lbs.....46 c | 15 to 100 lbs.....40c
10 and 12 lbs.....43c | Ingot Copper.....
| Bolt " 45c

Solder.—Extra Fine, C. .....21c | Ordinary, No. 21c
B. & Co.'s Brand ..25c | Plumbers' Solder.....24c
Fine, No. 1..... .23c | Braz'rs' or Spelt'r Solder .35c

Antimony.....20c

Babbit Metal.....15c @ 25c

Galvanized Iron Conductor Pipe.....₩ lb 10c

Sheet Iron.—
| Common. | Smooth. | Charcoal.
No. 14 to 24..... | 5¾c | 6¾c | 8¼c
25 & 26..... | 6 c | 7 c | 8¾c
27..... | 6¼c | 7¼c | 9 c
Add ¼c ₩ lb for 30 in. wide.

Galvanized Iron.....dis 15 %
No. 16 to 20.....12c | No. 27.....15c
24 to 24.....13c | 28.....16c
25 & 26.....14c |

Russia Iron.— | No. 1 Stained.....20c
Perfect.....22c | In Sheets, 1c. higher.

American Russia.— | B.....11c
A.....14c | In sheets, 1c higher.

Lead.— | Lead Pipe, in full coils 10½c
Pig..... 8½c | Lead Pipe, when cut, 11c
Bar.....10c | Sheet Lead.....10½c

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 42 to 48 Battermarch St.)

Anvils.—Eagle, ₩ lb 11c. currency.....dis 15 @ 15&5 %

Axes.—Forester's Favorite, Bronzed.....$13 00
Blue Jackets, Blue..... 12 50
Chopper's Prize, Bronzed..... 11 00
Red Cross, Red..... 10 50
Red Cross, Handled..... 13 50
Boy's Handled Blue Jackets..... 12 00
Hunts Axes.....₩ doz $15 @ 17 50 net @ 5 %
" Hatchets..... net
Shingling Nos. 1, 2, 3.....₩ doz $7 25 8 00 8 75
Claw " 1, 2, 3..... " 7 75 8 50 9 25
Lathing " 1, 2, 3..... " 7 50 8 25 9 00

Axe Handles.—Hickory, Fisher Pat..No. 1 ₩ doz $2 75
Hickory, Fisher Pattern..... " 2 " 2 00
Oak, " " ..... " 1 " 2 75
" " " ..... " 2 " 2 00
" " " ..... " 3 " 1 50

Bells.—Hand.....dis 60&10 %

Bolts.—Carriage, Phila., "Girard Works".....dis 50 %

Borers.—Angle, Backus.....dis 30 %

Boring Machines.—Angle.....each $4 75
Common, Snell's quality.....each 3 75

Breast Drills.—Miller's Falls, $30 per doz.....dis 25 %

Braces.—Barber's.....dis 40 %
Backus'.....dis 50 %
Spofford's.....dis 40 %

Butts.—Union Drilled Loose Joint.....dis50 %
" " Acorn Loose Joint.....dis 50 %
" " Fast Narrow.....dis 50 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....dis 30 %
Wrought Narrow Butts.....dis 30 %

Carriage Jacks.—Young America.....₩ doz $21 00

Cartridges.—"U. S. Cartridge Co."....dis 50 %

Chisels.—
Socket Framing M., B. & D's, warranted...dis 60&10 %

Cordage.—Manilla.....₩ lb, 16½c
American Tarred Hemp Lath Yarn.....₩ lb, 10c

Cow Ties.—
No. 30, open ring, 3 ft., No. 6, with toggle..₩ doz $3 37
No. 35 " 3 ft., No. 6 " snap....₩ doz 3 62
No. 40 " 3½ ft., No. 5 " toggle..₩ doz 3 75
No. 45 " 3½ ft., No. 5 " snap....₩ doz 4 00
No. 50 " 4 ft., No. 4 " toggle..₩ doz 4 25
No. 55 " 4 ft., No. 4 " snap....₩ doz 4 50
No. 60 " 4½ ft., No. 3 " toggle..₩ doz 4 50
No. 65 " 4½ ft., No. 3 " snap....₩ doz 5 00

Crow Bars.—Iron. Steel Points.....₩ lb, 5½c

Door Springs.—Stimson's Patent.—
No. 7, Light inside doors, $12 00.....dis 25 %
No. 8, " outside " $18 00.....dis 25 %
Torrey's.....$4 00

Files.—Earl Smith & Co.'s English.....$5 to ₤ gold
American.....$5 to ₤ currency, less 10 %
Nicholson.....$5 to ₤ currency, less 10 %

Funnel Irons.—$2 50 | $2 50 | $2 50 | $2 25 per doz
| 5, | 5½, | 6, | 7 inch
Deep Flange, $3 50 | $3 75 | $4 00 per doz
| 5, | 5½, | 6 inch

Hammers.—Maydole.....dis 5 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, 5 " " " " " bell face, No. 1, $11; 1½, $9 75.

Hangers & Rollers.—Novelty.....dis 30 %

Hatchets.—Underhill Edge Tool Co.....dis 10 %
Underhill pattern, solid, C. S. lathing.....$9 50

Hinges.—Strap and T, Stanley Works.....dis 25&7½ %
Wrought Screw Hook.....₩ lb 8c

Locks.—P. & F. Corbin.....new list dis 50&5 %

Mattocks.—K. P. & Co., axe finish, long cutter..$13 75
Short cutter..... 13 50

Meat Cutters.—"Miles",.....dis 30 %
No. 1, $22; No. 2, $30; No. 3, $40 per doz.
American, $6 each.....dis 25 %

Metal.—Babbitt, No. 1, 35c; 2, 25c; 3, 16c. a. 15c ₩ lb

Nails.—10d and larger.....$4 25

Paper.—Finest Quality Manila.....₩ lb 11c

Parers.—Reading, New Pattern.....per doz $8 00
Turn Table.....per doz 8 50

Picks.—K. P. & Co., Polished Points—
5 to 6.....per doz $10 00; 6 to 7, $10 50

Pulleys.—Clark & Co.'s Axle, 1¾ in.—
.....per doz 37c.; 2 in., 42c

Plated Ware.—Rogers Bros.....new list dis 35 %

Plumb & Levels.—"Davis" Pat. Adjust..dis 50&10 %
"Davis" Pat. Adjustable Inclinometer, wood and iron.....dis 35½ %

Pocket Knives.—Conn. Cutlery Co.....new net list

Rivets.—Black.....dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8,
" 13 13 14 14 15 16c ₩ lb net

Sad Irons.—Reading.....₩ lb 4½

Sand Paper—0 to 2, $4 25; 2 to 3, $4 75.....dis 10 %

Saws.—Disston's.....dis 12½ %
Lightning X cut, Boynton's.....per foot 61c
" Saw Blades, 32 inch.....per doz $7 00
" Framed Saws.....per doz $9 00
Common " " .....per doz 6 00
Disston " " .....per doz 9 00
One man X cut.—Lightning.....$2 75 each
Disston's $3 00 each.....dis 12½ %

Scythe Stones.—
"Willoughby Lake," first quality.....₩ gross $6 50
" " second quality..... " 3 00

Saw Clamps.—Reading.....$11 25

Screws.—American Screw Co.....new list dis 62½ %

Shovels.—O. Ames.....new list dis 12½ %
M. B. & D.....new list dis 12½ %
Snow, malleable iron tip, D handle.....$5 50
" " " plain..... 5 50
Carr's Iron, Black Strap...Black, $5 50; Polished, $6 50
Collins, C. S.....$8 00

Sifters, Coal.—McMasters.....$12 00

Sinks.—Cast Iron, 2, 2½, 3, 3½, 4, 4½ feet.
$1 37 $1 62 $2 25 $2 75 $3 75 $4 75 each.

Tools.—Aiken's Pattern, 20 in set; Miller's Falls, $12 00 per doz.....dis 15 %

Traps.—Oneida.....dis 20 %
Blake's.....dis 20&5 %

Vises.—S. P. & Co.'s Solid Box, Blacksmith...₩ lb 14½c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
"Howards." Parallel.....dis 15 %
Fisher & Norris' Double Screw Paral'l..dis 15 @ 15&5 %

Weights.—Window Weights.....₩ lb 2¾c

Wrenches.—Coe's Genuine Wrenches.....dis 40 %

Wringers.—
Novelty and Universal } Tub No. 2 } less than 5 doz..₩ doz $ 72 00
" 5 doz..₩ doz 69 00
" 10 doz..₩ doz 67 00
Monitor, Double Cogs.....per doz 66 00
Novelty Bench, No. 4, less than 5 doz..₩ doz 108 00
" 5 doz..₩ doz 104 00
" 10 doz..₩ doz 101 00

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz.)

Tin Plates.—₩ box
I. C. Char. 10x14 @ $12 50
I. C. Coke 10x14.. 11 00

Pig Tin.—₩ lb
Banca..... 30c

Copper.—₩ lb
Sheathing..... 33c

Lead.—₩ lb
Pig..... 7½c
Char. Roof. I C, 10x14 $12 00
Coke " I C, 10x14 11 00

Straits..... 31c
English..... 30c
Bolt..... 35c
Ingot..... 26c
Sheet and Pipe..... 9c

Spelter.....₩ lb 9½c
Zinc.—Sheet..... " 10½c
Antimony..... " 16c
Iron.—Sheet Iron, Russia..... " 19c
Sheet Iron, English..... " 5½c
" " American Refined..... " 6¾c
" " Galvanized..... " 11½c
Plate Iron..... "
Swedish and Norway Bar Iron, gold.....₩ ton, $185 00
" " Shapes, gold..... 162 50
Norway Nail Rods, first quality, gold..... 162 50
" " second " " 147 50
Best Refined Bar Iron..... 75 00
The "Burden Best" Iron..... 112 00
American Pig Iron, Foundry, No. 1, x..... 38 00
" " No. 2, x..... 36 00
" " Gray Forge..... 32 00
Scotch Pig Iron.....₩ ton 41 00 @ 48 00
Wrought Scrap Iron..... 42 50

Steel.—₩ lb
Eng. Tool..... 18c
American Tool 15½c
" Mach 11c
Bessemer ... 7½c

German..... 11 c
Spring..... 8 c
Tire..... 7 c
Sleigh Shoe..... 5½c
Tow Calk..... 8 c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Anvils.—Armitage.....₩ lb, gold, 15c
Peter Wright's..... " 14
Wilkinson's..... " 12

Apple Parers.—Conqueror.....₩ doz, $9
Lightning..... " 9
Turn Table..... " 9 00

Augers and Bits.—Cook's.....dis 25 %
Ives.....dis 20
Jennings.....dis 5 %
Snell's.....dis 12½ %

Axes.—Hunt's.....₩ doz $14 00 @ 15 00
Lippincott's..... " 13 00 @ 14 00
Lippincott's Pioneer..... " 13 50 @ 14 50
Simmons'..... " 13 00 @ 13 50

Axles.—Kritch & Crane Mfg. Co.'s—
Patent Taper Axles.....new list net
Swelled Taper Axles.....new list net
Concord Axles.....new list net
Red Jacket Axles.....new list net
Common Axles, 1½ inch and upward.....₩ lb, 8¼c
" " less than 1½ inch..... " 9¼c

Bellows.—"Best St. Louis make" 60c ₩ in. dis 20 %

Bells.—Troy, Church.....₩ lb, 50
Light Brass, Hand.....dis 50 %
Moore's, Cow.....dis 20 %

Bolts.—Arms, Bell & Co.'s Machine.....dis 20 %
Arms, Bell & Co.'s Carriage and Tire.....dis 70&15 %
Cast Iron Barrel, Shutter, &c.....dis 25 %

Cast Butt Hinges.—Narrow Fast Joint.....dis 35 %
Broad Fast Joint.....dis 40 %
" Loose " .....dis 50 %
Reversible.....dis 45 %
" Japanned and Silver Tipped.....dis 45 %
Loose Joint "Acorn" " " .....dis 40 %
Excelsior Reversible Blind.....dis 30&10 %
Lull & Porter's Blind.....dis 45 %

Wrought Butts.—Narrow.....dis 20 %
Reversible.....dis 25 %
Broad.....dis 25 %
Table Hinges.....net list
Back Flaps.....net list
Inside Blind Hinges.....net list

Chain.—Eng. Coil. 3-16 ¼ 5-16 ⅜ 7-16 ½ in.
13 11 10 9½ ₩ 8c gold
Trace.....6½c 7c "
7-10-2 7½c "
German Coil and Halter.....revised list add 10 %

Chisels.—Socket, Firmer or Framing.....d 1,55 %

Clothes Wringers.—Crown.....₩ doz $60 00
Novelty..... " 72 00
Universal..... " 72 00
Monitor..... " 72 00

Corn Knives.—Dunn E'ge T'ol Co.'s Clip..₩ doz $5 75
Disston's..... " 6 00

Crow Bars.—Steel Pointed.....₩ lb 7@9c
Solid Cast Steel..... " 20c

Cutlery.—J. Russell & Co.'s.....
Lamson, Goodnow & Co.'s..... } new list, dis 15 %
Landers, Frary & Clark's.....

Files and Rasps.—
Nicholson's Mill Files.....$5 50 to the ₤, currency
Nicholson's Other Files.....5 00 to the ₤ currency
Butcher's Mill.....6 75 to the ₤ currency
Heller's & Bros' Horse Rasps...5 25 to the ₤, currency

Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks.....dis 30 %
" " Handled Hoes.....dis 30 %
" " Planter Eye Hoes.....net list
Winsted's Planter Eye Hoes.....net list

Hammers.—Yerkes & Plumb.....new list net
Masons' Hammers.....₩ lb 20c
Smith Hand Hammers..... " 22c

Handles.—Axe.....Extra. No. 1. No. 2. No. 3
$2 75 $2 25 $1 75 $1 00
Pick.....Extra. No. 1. No. 1½. No. 2.
$2 50 $2 00 $1 75 $1 25
Smith & Montross Fork, Hoe and Rake.....dis 20 %
" " Broom and Mop.....$12 @ $18 ₩ M.

Harrow Teeth.—1 inch iron.....₩ lb 4½
⅞ and 1 inch iron..... " 4¾
⅝ inch iron..... " 5
Barbed or Headed.....½c extra

Hatchets.—Hunt's.....net us
Simmons'.....dis 10 %

Hay Knives.—Lightning.....₩ doz $22 }
Dunn Edge Tool Co.'s.....₩ doz $14 50—dis 15 %
Fisher's..... " 16 50—dis 10 %

Hinges.—Strap and T—St. Louis make.....dis 25 %

Horse Nails.—Eureka.....23c rate
Ausable.....22c "
Northwestern.....22c "
Eagle.....19c "
National Patent Pointed.....21c "
" " Extra Finished.....22c "

Horse Shoes.—R. I. (Perkin's pat.).....₩ keg $6 25
Burden's..... " 6 25
Mule Shoes..... " 7 25
Rhode Island Trotting Shoes..... " 8 75

Locks and Latches.—
Jones & Nimick's.....revised list dis 40 %
Moorhead, Adams & Co.....revised list dis 40 %
Norwalk Lock Co.'s.....revised list dis 40 %

Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks...₩ doz. $15 00 @ 16 00
" Grub Hoes, Oval Eye...₩ doz. 12 00 @ 13 00

Nails.—Wheeling.....$4 35 rates
Orders for 100 kegs 10c ₩ keg less.

Picks.—Klein, Logan & Co.'s R. R. and Clay ₩ doz.$12 00
Klein, Logan & Co.'s Coal..... " 9 75
" " Poll..... " 12 00
" " Stone..... " 16 50
" " Tamping..... " 19 00

Planes.—Ohio Tool Co.'s.....dis 20 %
Sciota.....dis 25 %

Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $27; No. 2, $30; No. 3, $32.....dis 20 %
Barton's Patent..... ₩ doz $25—dis 20 %
Vaughn's " ..... " 25—dis 10 %

Sad Irons.—Monitor Brand, Silver Polished...₩ lb 5c

Sash Weights.—Standard Solid Eyes.....₩ lb 3½c

Saws.—Disston's.....dis 10 %
Spear & Jackson's.....$5 00 to ₤ gold
Hubbard, Lippincott, B. & Co.'s.....dis 10 %
Branch, Crooks & Co.'s.....dis 10 %
Livingston's Patent Buck.....net list

Screws.—American Screw Co.'s revised list.....dis 45 %
$2000 worth in 6 months.....2½ % extra

Scythes.—Blood's C. S. & G. S.....net list
Dunn Edge Tool Co.'s.....new list dis 25 %
Paris Furnace Co.'s.....dis 25 %
Waldron's English.....$10 00 to ₤

Scythe Stones.—No. 1 Ind'n Pond ₩ gr's, $7 00 }
Extra Indian Pond..... " 7 50 }
Premium..... " 9 50 } dis 25 %
Diamond Grit..... " 13 50 }

Shovels, Spades and Scoops.—
Ames'.....revised list dis 5 %
Lippincott's.....new list dis 10&5 %
Rowland's, Maxwell.....revised list dis 12½ %

Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished.....₩ lb, 17c
Solid Cast Steel..... " 35c
Striking Sledges.....₩ lb extra, 1c

Snaths and Cradles......dis 25 %

Springs.—Cleveland Spring Co.'s—
Carriage and Express.....dis 5 %
Blue Seat Springs.....new list dis 10 %

Tacks.—Norway Tack Co.'s ½ weight.....dis 70 %
Brads.....dis 50 %

Thimble Skeins.—Pump & Skein Co.'s....dis 50&5 %

Traps.—Newhouse Patent.....dis 15 %

Vises.—Solid Box.....₩ lb 16c
Wilson Mfg. Co.'s.....dis 15 %

Wrenches.—Coes' Genuine.....dis 30 %
Coes' Pattern.....dis 40 %
Taft's.....dis 50 %

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.
IC, 10x14, Charcoal...$13 50 | IC, continuous, 20 in. x 200 ft.....
IX, 10x14, " ... 16 50 | IX, continuous, 20 in. x 200 ft.....
IC, 12x12, " ... 14 00 | IC, 10x14, best Coke..$12 50
IX, 12x12, " ... 17 00 | IC, 10x14, good " .. 12 00
IC, 14x20, " ... 14 50 | IC, 10x20..... 20 00
IX, 14x20, " ... 17 50 | IC, 14x20..... 12 00
IC, 14x20, Terne..... 18 00 | IC, 14x20, Coke Lead. 12 00
IX, 14x20, " ... 16 00 |
IC, 20x28, " ... 26 00 |
IX, 20x28, Terne..... 31 00 |

Block Tin.
Large Pigs.....38c | Bars.....43c
Small " .....39c |

Sheet Zinc.
Casks.....₩ lb 10 c | Sheet.....₩ lb 11c

Solder.
No. 1, Refined, in bars or plate.....25c
No. 2, " " 23c
Pig Lead.....8½c

Sheet Copper.—15 to 100 lbs. Sheets 30x60.....30c
14 to 16 lbs., Sheets 30x60.....35c
10 to 12 lbs., " and 20x72.....38c
6 to 9 lbs., " 41c
Tinned, 14 and 16 oz. 14x48.....38c
Planished, 14 and 16 oz. 14x48.....41c
" No. 7, 8 and 9.....43c
Copper Bottoms.....37c

Sheet Iron.—
| Com'n | Sm'th. | Char'l. | Japan.
No. 16 to 20..... | 5¾c | 6c | 8¼c | 10¼c
No. 22 to 24..... | 5¾c | 6c | 8¼c | 10¼c
No. 26..... | 6c | 6¼c | 8¾c | 10¾c
No. 27..... | 6¼c | 6½c | 8¾c | 10¾c

Galvanized Iron.....dis 40 %
Iron Rivets.....dis 15 %
Iron Wire.....dis 30 %
Coppered Market Wire.....dis 40 %
Copper Rivets and Burs.....dis 10 %
Russia Iron.—Nos. 9, 10, 11 and 12, ₩ lb.....12c @ 22c
No. 1, stained, ₩ lb.....30c
Imitation Russia, ₩ lb.....14

Machinery, &c.

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MACHINIST and ENGINEER,
Nos. 537 & 539 Dickinson Street,
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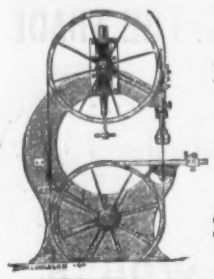

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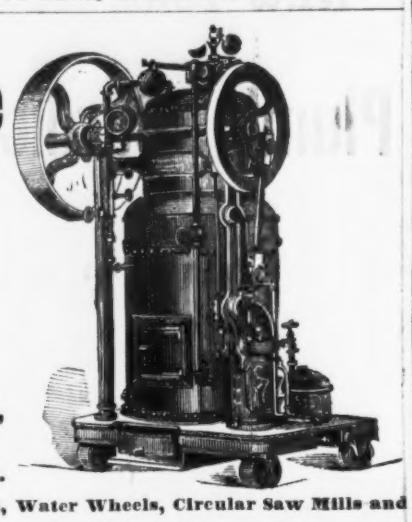

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SHAFTING, with Patent Adjustable Self-Oiling Bearings.
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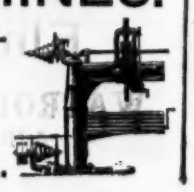

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That will head 10,000 per day.
Single & Double Head BOLT CUTTERS,
That will cut from 5000 to 10,000 per day.
Bolt Pointers, Tapping Lathes, Tire Blank and Rivet Headers, Engine Lathes, &c.
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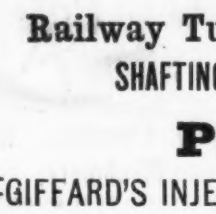
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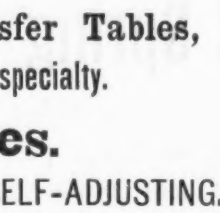
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Warranted superior to any made.

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Machine Finished, Case Hardened and Interchangeable.

Self-Sustaining Rope Pulley Blocks

Being worked with a rope the motion is quick and steady, and in many cases is more suitable than the chain block. It is self-sustaining, the eccentric brake being put in or out of action by moving the hand-rope to the right or left, or by pulling the rope outward. The weight can be lowered or sustained at any desired point.

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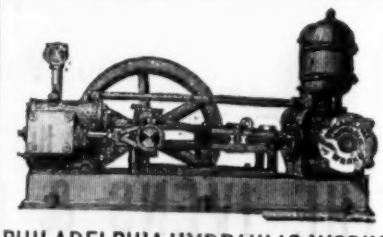

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XXX	Metal Nickel Hardening	55 cts. ℔ lb	
XX	Metal Nickel Hardening	50 cts. ℔ lb	
X	Metal Copper Hardening	45 cts. ℔ lb	
A	" " "	40 cts. ℔ lb	
B	" " "	35 cts. ℔ lb	
C	" " "	30 cts. ℔ lb	
D, E, F	These metals are alloys of lead, with a large percentage of tin, antimony and copper, according to price.		25 cts. 20 cts. 18 cts.
G, H, I, J	These metals are the ordinary low priced Babbitt alloys, used where there is not much wear on the machinery, and where economy is required.		16 cts. 14 cts. 13 cts. 12 cts.

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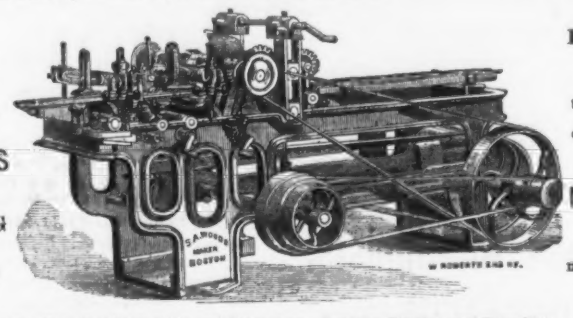

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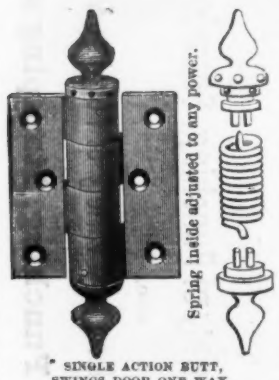

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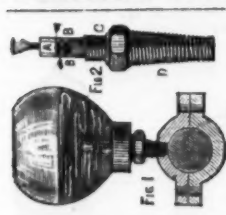

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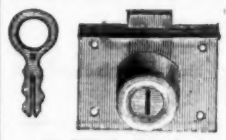

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